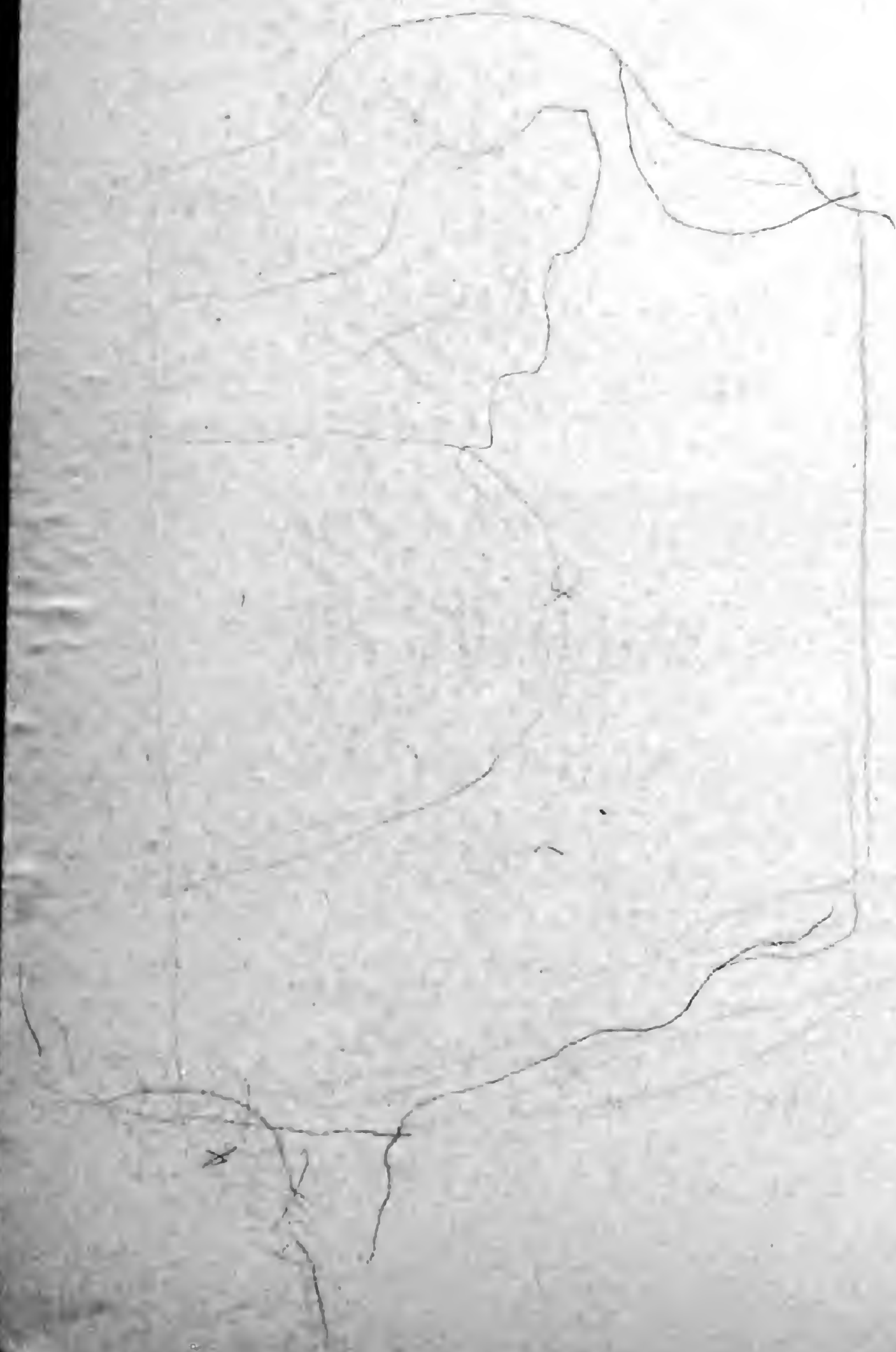


II 1910
Muscatine Co.
Plants.

Giony Falls
+ Canton,
Denison
So. Omaha
Rockport, Mo.



5. Winn

13

3 leaves

1877

1. William

1997

[illegible]

In evening

7:30 am

to 10:00 am

at mouth of river

bottom of river

5' - 12' mixed with gravel

12' - yellow clay mixed with gravel

3' - 5' mixed with black sand

3' - yellow clay mixed with sand

2' - gravel

5' - 12' clay (yellow)

2' - gravel (clean)

18' - Gravelly, see with

(Level of prairie)

12' - Black loam nearly pure
from above

6' - yellow undisturbed clay,
no (or very few) pebbles

all along road camp, 11.
from Canton to the plain.
Kansan shows along road.
The plain is really not up
quite a bit, yet northwards
shows a few little hills.

In sec. 35, *Livingston* sh. *etc.*
there is a series of *horizontal*
exposures - *very* *distinct*
jointing *along* *minerals*, *fully*
calcareous. *Next* *one* *about* *1/2* *mi.*

W. of RR. on E. side of road
along creek a deep cut
(washout) shows bluish unweathered
jointed Kanran.

There are numerous ridges
on the slope between the
ledges above. These ridges rise
about 40 ft. above the bed.

On the side of the hill
and in some of the
is a fine view of the

stream running through the valley

4 to 5 miles from the mouth

of the river to the mouth of the

stream, the land is very fertile

and is covered with a growth of

timber, with some

openings.

The soil is very rich and

the water is pure.

A fine exposure of sand,

which is on the side of the

ending in the S. direction.

There is a fine view of the

stream from the top of the

hill.

6 ft. of sand, with some

shells, and a few

small stones.

7 ft. of sand, with some

shells, and a few

small stones.

8 ft. of sand, with some

shells, and a few

small stones.

9 ft. of sand, with some

shells, and a few

small stones.

10 ft. of sand, with some

shells, and a few

11

12

13

14

15

16

17

18

19

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41

42

43

In the morning...

11th
12th

At (at) 8-10 ft - top of

There is a great slump

I could trace Nebraska up

for 25 ft above bottom

Then as slumpy place
with springs, sand & some
water out - probably

8-10 ft - then good

Kansas above

A whole series of
wooded slumps - gully
breeding in same level -
appears above this.

a greater slump...
than those just...
but... of the...

no water...

Near

... along same line

Walked up the river... 3/4 of
a mile... 1/2 mile...

rough & heavily... I
saw no... (could not
reach the... for... on
account of rain, late hour)
& no strings.

Returns to... and
reviewed notes, etc.

Top of Nebraska	35 ft
Top of Affrician	80 ft
Top of Kansas	85 ft

The river is... fully
with... of gray... fine - joints
with... from lower...
One... = 6...
Other... = 10...
From top to about 50 ft...
fine... & gray... fine... and

Sep. 5, 1910 (Monday)

Spent forenoon in packing, writing letters, looking up notes, etc.

Sent two baskets to Dr. Fred S. (H.S.)

At 2 P.M. went to Fairview by rail.

Rained all but 1 hr. was quite clear.

Went to Fairview from exposure at (A) in sec. 16.

Lower bottom about 10 ft. above water

Top of Nebraska = 35 ft.

Top of Jefferson sand = 70 ft.

Top of Kansan = 85 ft.

The Kansan is gravel, brown, pebbly, with two strata of gray silty fine-grained stuff.

(One sample from lower one)

One 3 in = 6 ft. from top

Other 6 " = 10 " " "

From top to about 55 ft.

(from bottom) fine sand

and fine gray fine-grained silty

alternating

at the base of the Kansan

the gray stuff is

coarse, silty

fine-grained stuff

fine-grained stuff

fine-grained stuff

fine-grained stuff

fine-grained stuff

fine-grained stuff

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fine-grained stuff

fine-grained stuff

dark carbonaceous
material
For several feet above
the base there are
thin layers of sand &
shale.

The contact with the
limestone is
unconformable.

The top of the limestone is 17 ft. thick,
about 10 ft. of which
is covered by a thin layer of
thin bedded sand. The
rest of the sand is
thin bedded, and above the
limestone.

Probably 2 ft. of the limestone
was exposed, not covered
with talus.

Farther W. only a
shaly plain appears
1 spring.

The S. side of the river is about
15 miles east of Java as line.

17
In the garden, all these
are always found in light
at the base, however, as the
limestone is thin bedded
the top of the limestone is
unconformable, and the
limestone is not
unconformable.

One is better. Sw. appears
further.

I can see some limestone
conglomerate in little banks at
foot of hill along river.

In bed of river near (a)
is a bank of limestone, thin,
granular, calcareous, containing
few boulders, 20 ft. or more.

For a mile up the river
west to the spring there are
swamps & fields, & a
small village.
Near upper end of river
is a big spring, & a
swamp, & a small village.

Where road runs up
on terrace or bench
plain, on S. side 10-
15 ft. typical Kansan
is exposed.

This is the bit of Kansan
plain W. of river & it
is somewhat higher
than terrace S(W) of
the river, on the Iowa
side.

19
Sep. 6 (Tuesday) 1910

Left Center at 6:45 AM for
Lindown.

Grew N. on lower side.
Near W. end of line. Then
ac. 5 x 6 on ...
flat. (They are all flat
except ... some distance)
there is a cut about 6 ft.
... yellow ... nodular
above ... fairly ?.

Loess

near S. end a couple of feet
of ... exposed - also
on slope south.

Centered only on ...

Similar yellow loess above a
mile E..

The new C. M. & O. road gravel
pit is just being stripped - a
yellow loess top-dressing - 2-4 ft.

At x E. of Hudson the road
goes down & gain up ... 910
of terrace. It is gravelly &
immaculate coarse-sandy at both
points.

Between ... 81/2 ... 81/2 ...
there are two road cuts showing
3-4 ft yellow sandstone ...
& Kansan ...

The ridges ...
Kansan ...
lives on top.

Saw spring below at about
terrace height above the river.
at bluff there is a nice
streamlet coming out of some
large ravines & it has
much sand washed in.

At N. exposure on same line
(2) the yellow lens runs down
into fine laminated sand
(probably wind-blown).

A line of boulders at base
at the base of the road on
a gray silty layer.

On bank of creek at point ...²¹
the ... (...) rises
over 20 ...
above ...
Where ... it is ...
whitish.

The creek has much sand.

The bluff of river ... 135
ft above ... valley.

At Iowa end of bridge across the
big river a road cut shows 4 or
5 ft. of sand (silty) and under
it a bouldery layer & gravel.

cut 1

At ...

...

...

...

...

...

...

...

...

...

...

cut 3 Found gravel exposed along creek, & wherever they dig a well or excavate gravel appears. Visible also C.M.W. somewhere just ... this shows 5 ft of sand & gravel, then high gravel. Below cleaner sand & gravel, cross-bedded

cut 2 at dam outcropping of crinoid shale appears low down.

Sep. 7 - (Wednesday) 1910 23

Wanted to go from ...

...

see (4) ...

...

...

...

...

...

...

cut 15 on S side S.E. 1/4 sec. 14-95-48

...

...

...

...

...

...

...

cut 7 - This is small cut on a very

...

...

...

...

...

...

cut 8. Exposure of surface
of crest of bluff
from top of ridge to
top of cliff 75 ft

The lower part of the
is weathered, gray, pebbly,
but friable, white, etc. etc.
It is mostly Kansan.
The line between Kansan
& Aftonian is shown by a
series of small, etc.

The Aftonian has been
covered a great distance
but I found a very good section
in the undisturbed bank
showing position clearly.

The Aftonian in exposure
in short & shows rather
wavy sand & small pebbles.
Layers of finer sand, etc.
Some of the sand is
oxidized. It is the usual
Aftonian mixture.
Springs come out at base &

judging from position
the Aftonian is about 70 ft thick.

A very thin gray pebbly layer
(see sample)
rises about 4 ft
It has been in the
in it, etc.

In N.E. of corner of
bluff is a bank of 80 ft
It is Aftonian, etc.
The line between
is a good section of the
part of the same.

Opposite the sand, near river,
blocks (all separated, etc.)
which will appear at 95
ft from top.
I could not find a
section of the same.

Photos 21 & 22 show cut
S. looking nearly S.
The river is 160 ft below top
of bluff.
Another sharp stream farther up
river, but overgrown.

Cut 9. 13' cut E of (Kansan).
 in C. 100 (new cut)
 This runs to 7 ft deep &
 shows yellow clay with
 shells below.

Cut 10 is just as deep &
 long, & was greater, and
 10-14 ft. deep. From
 it runs probably 20 ft.
 It shows Kansan, some
 of it like few pebbles in
 west part, where it looks
 like a wash.

Back nearly away from west
 end there is typical bluish,
 ferruginous, staining, calcareous,
 pebbly Kansan.

It breaks off abruptly.
 The part above true Kansan
 shows sand & gravel in lower
 part, especially between two
 groups of Kansan.

It is stratified & ferruginous.
 The tough Kansan like material
 (or loam like) is also more or less
 stratified towards base.

N. side of cut 10

(see next page)

5-6 ft
 } ferruginous sand
 Kansan like, 10 ft. thick

In this part, like Kansan, but
 (see next page)

very fine
 sand

Kansan

(see sample)

S. side cut 10

Peat
 Kansan
 Kansan

Kansan

The Kansan contains some small stones, & towns, W. end, they

strike same as peat. Spring, Kansan, 10 ft. thick, (see next page)

also? Kansan also 10 ft. thick, (see next page)

One more peatbed contained 10 ft. thick, Kansan

2. m. N. side cut 10



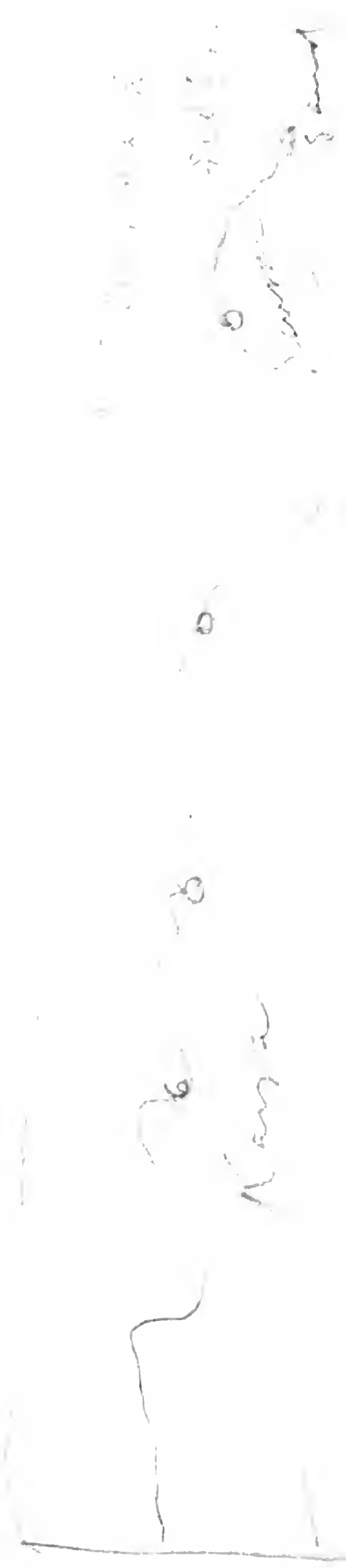
cut 11 is small but similar to cut 10.
 Shows clean Kansan sandstone which is 11' thick
 sandstone, is thin / thin sandstone
 cut 12 shows 6-8 feet of yellow sandstone, sandstone and
 4 in. sandstone below RR grade
 The cut was made below RR grade
 gentle slope, for the purpose of getting fossils.

cut 13 N. side. W. end.

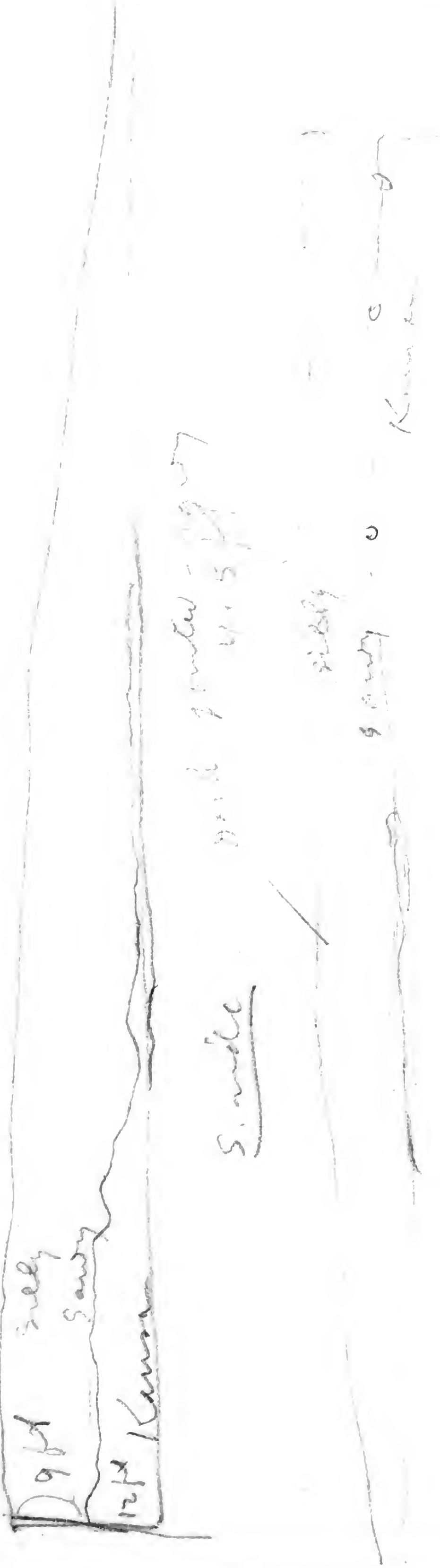
sandy soil



cut 13 is small but similar to cut 10.
 Shows clean Kansan sandstone which is 11' thick
 sandstone, is thin / thin sandstone
 cut 12 shows 6-8 feet of yellow sandstone, sandstone and
 4 in. sandstone below RR grade
 The cut was made below RR grade
 gentle slope, for the purpose of getting fossils.



cut 13 E. of another bridge - cut
N. side



All these cuts are in lower part of the
series of low hills by which surface rises
eastward from the Kanran. They do not
cut the highest part.

The highest ridge S. are
70 ft. higher than top of cut 13

1170
1240

Bluff above Chatsworth.
The top of ridge is
above P.H. Reads 1065.

The first hill cut at 11.
and shows 1 ft of
shale with 3-6 ft of
typical Kanran above it.

In the 2nd section cut
shale (blue below) is clearly
struck above (see samples)
rise to 35 ft above P.H.
then form a low ridge at base
then form a low ridge (see sample)

80 10

~~This is the highest part of the ridge~~
~~at cut 13~~
From N. there is a band
of rusty sand & gravel with
some boulders resting
directly on shale. It shows
in places 1-3 ft thick. Above

it is fine laminated
sand showing up as
into rock.

The upper part of the
wall is light & fine
mud like the lower part
Helmian shales
from Cut 10000,
10000 ft. thick.



2nd cut S shows a
bed of dirty sand
above shale.

Small
cut 14

low
cut 15



The 3rd cut is 1000 ft. and
shows a bed of sand
1-2 ft. thick
Then shale.

The 2nd cut is 1000 ft. and
shows 4 ft. of sand
above shale, then shale,
very thin layers of sand
(cut with 1000 ft. of
laminates)
Then cut is 1000 ft. and
4 ft. of sand
(cut with 1000 ft. of
laminates)
Then shale.

The RR is about 25 ft
above bottom.

cut 18

2 mi S. of Hawarden
along wagon road is -
deep (12 ft) loess cut
(both sides road).

It is yellow, few nodules
(mull) above, laminated
below, and all fine.
Seen to get somewhat
fine-sandy in lower
parts in places.

Sept. 8 - (Sunday) 1910³⁵

Left Hawarden at 7:40 am

for Alton

Worked out of Alton &
down N.

cut 5 - just N. of cemetery, now down the
60 cut on E. side near which
is all fine sand & gravel.

cut 6 - This is St. Robert's Pros. pit.

It is up a slope, at end of ^{cut} slope.

The material is exposed about 10 ft.

They have gone about 3 ft.

further & have nothing but sand
& gravel.

The upper 6 ft is mixed, coarse,
feruginous stuff with some boulder, some
rotten.

There are streaks & bands of white
sand below.

Just lower springs come out, &
all along the bank here for
some distance springs come out at
same level. This line of springs &
steep places runs N. about 40 rods
& south about 1/2 a mile.

Reading top of bank (measured here) 1200

" " base of bank 1188

" " level of spring 1172

" " bottom (below level of RR) 1125

RR about 5 ft. higher

Drove to Olis Hill bluff (Hills)
Chattanooga

Reading at river level = 1085

" top of ... = 1115

" top of ... = 1140

Kansas rises to 1170

Typical, joints, etc. below,
fossils & a few boulders.

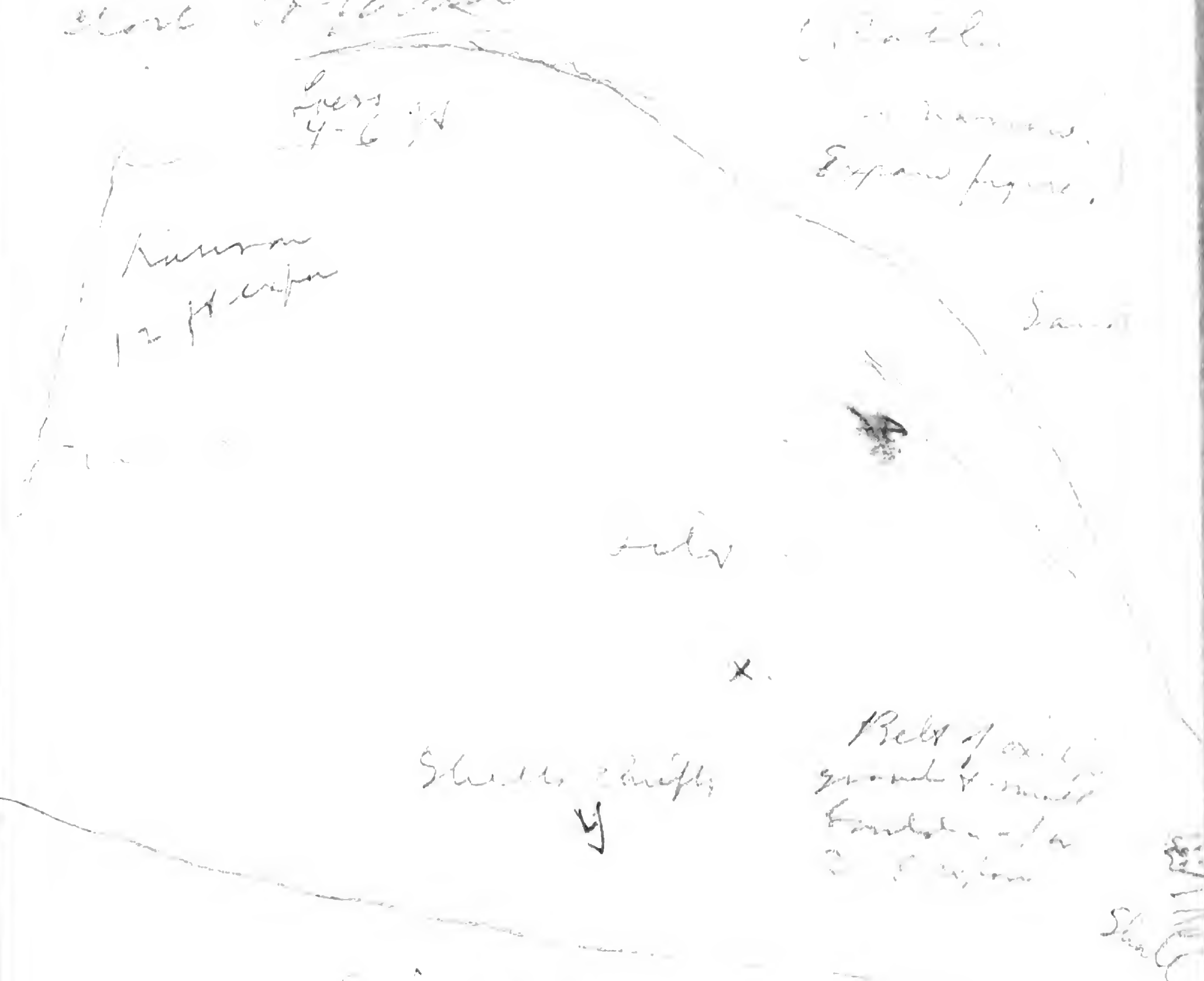
12 ft. exposed.

On top 4-6 ft. of yellow loess
sand seems to run up to about
1140. There seems to be only
a narrow band of it, but
the soil, varying in gray to
almost black - is fully 20 ft
exposed; it contains fragments
of shells even in upper parts,
but most of my collection was
made from lower part & which
is dark.

The Kansan has some boulders
in its lower part.

Could not make a clean

section, but last ...
close together



Olis Hill bluff
So. Dak.

Took sample of loess & 2 of shells.
at x & y (under sand)

Blue shale streaks at ...
& rises above in ledge

Very near the shale is
gray or rusty. Just exposed?
Probably naturally so - as far
as I could break in.

N. of main exposure I could
 see only coarse sand & gravel
 & a few small pebbles. E.g.,
 on lower wall, - a band of
 foot or so across

Returns to Chertwood.

afternoon
 cut 19 shows 6 ft of yellow loam,
 nodular a bit. It shows horizontal
 in low (weathered). Road cut.

cut 20. Road cut top of level N. slope
 shows about 5 ft of yellow loam,
 nodular a bit.

At Bluffs

Bottom reads 1160
 (this is not lowest point, but
 terrace).

RR. reads 1180.

cut 14 shows irregular
 weathered shale with
 some Kansan, typical,
 above it. It shows
 that the shale is
 irregular & porous
 in.
 see figure next page,

cut 14

5 ft.

D. Kansan

weathered
 looking like
 like a
 government!

The Kansan is
 like a
 This cut is a

cut 15 (Kansan)
 (darker color)

Looking



Shale

Photos 15 & 16

The south end of cut 5 shows
clean & clear

R.R. runs 1180.

Top of shale 1215

Kamran - 4-5 ft

Sandy for a foot or two above

Kamran & this grades up
into 6-7 ft, mostly
almost without nodules.

On ^{small} ~~some~~ nodules of ~~the~~
on top of Kamran.

The Kamran is light
bluish & brown, with ~~probably~~
calcareous; sand bedding,
(small & rare)

This part of cut is fine.

The sandy layer is
clearly between Kamran
& even & grades up
into latter. It
somewhat laminated
& fine

S. end.

N. end



In the south part of the cut the sand is
to rest directly on the shale, except for
of the section which shows a certain

New Section cut 15

Heavy
Sand
Kansan
Fertile sand & gravel
Shale

Of the Kansan sand & gravel (above) there is a 1 or 2 ft

then a foot or more of Kansan & then fine sand, laminated, at least 5 or 6 ft, grading up into a loess layer

which passes to a stand in columnar wall & is at least 12 ft. thick

The lowest sand which I marked as loess is first mixed & inter-banded with Kansan in some places.

The fine sand on the Kansan is very different, fine &

43

the sand (upper) Kansan. The sand is 2 or 3 ft. thick, very fine-grained.

The sand (upper) Kansan comes right to the surface gravel, but a large mass of gravel (2 ft) lies just above the sand which rests on a loess fine-grained gravel.

This is the base of the Kansan in it. - Silt 2-3 in. thick

Shale
Silt

My digging back out what appears to be from a thin layer of Kansan. But it is a mixture of a loess silt & boulders. The silt layer is 2 or 3 ft. thick. Laterally it is mixed in places with sand.

The Kans sand is made together
by inter strata.
There are considerable
sand in this - as in the
but I have seen just
and in the region of the
sand by river & dunes in
Muscataine co & at Dune Park.

At extreme base about 15
(below my point) there
is even above, sand
(laminated bed) &
then a bed of reddish stuff
(I call it Nebraska) &
that, then shale.

A line of boulders &
some sand & gravel
appear just above.

A sandy spring also
comes out at this place.

The boulders & pebbles
may be Kansan, more
likely Aftonian, or they
may belong to Nebraska but
I could see none in it.

(See sample of "Nebraska" 45
In the base of the 15 shale
shows at first a sandstone
then a bed of sand (lower
part coarse, becoming fine
part) & some pebbles.
It rests on a blue clay drift
(a red bed of it at top) - a
sample. Cretaceous shale, but
very like that I have seen
up the river.

The lower part of the sand
is decidedly Aftonian, but
upper part shows interlaminations
with silt (like the Kansan?)
& some of this interbedded in
lower divided into
Aftonian & Kansan, into a sandy
silt - & appears in the (see p. 1)

The laminated part may appear
to have been (see p. 1) a clay,

Loess?

silt + sand

some gravel

Shale

Cut 16

At cut 17 RR now
road 1150

At N. end of cut shale
at road level - 20 ft above
Then about 2 ft of
very ferruginous sand &
gravel.

Then Kansan -

A clear case of Aftonian.
To right loess appears
above Kansan.

47
Remains of the Kansan
is very sharp. The shale
is yellowish, with yellow
lime or sand at various
with small boulders, making
upper line of Kansan.
On this rests, with 2 ft of
1, which is a yellow
loess, all the way up.
Breaks into columns, has
vertical face, and is
now only 1 ft thick.
up to Kansan.

6 or 7 ft of Kansan above.
Below is shale, - later.

But at S. end the lower
part is distinctly sandy, interbedded
with silt as before. At least
5 or 6 ft above the loess.

Below it clearly rests on
Kansan, - no doubt of that.

Photos 19 & 20
cut 17-

Locs

o o o
Kansan

The bluffs between Abson
& Whitworth are just the
ordinary low, rounded Kansan
topography hills. They
extend back eastward as far
as I could see from the hill tops.
Gravel to Dakota with the
hills run - the hills are
all along, and are similar
but perhaps rather more
abrupt.

Put up at New Kendall Hotel,
cold!

Sep. 7 (Friday) 1910. 49.

Left Abson at 8:30 AM for
Whitworth.

The section (as cut yesterday) reads
10.35 at Abson at 8:30 AM this morning.

Cut 7 is a small cut & gravel
pit. Its top is 25 ft. above the
road which it runs.

Its upper part is made of
calcareous, sand & shales.

It has cross-bedding
evidently Kansan in character.
Only 4-5 feet exposure.

Cut 8 is just in turn of road. It
shows 6-8 ft. of shaly stuff, but
it looks more or less rounded & very
calcareous in places.

It is evidently continuous stuff.

The bluffs below the turn
in road become higher, rougher,
& more calc. stuff. There is evidently
much more loess piled up on
them.

At 9 shale shows at top of
ridge not less than 50 ft.
above bottom.

Went up into sec 18

The things here are at 1175.
There are 2 or 3 springs
at a point they level on
both sides of the Dry Run
valley.

There are at least 3 springs
on slope above (N.E.) of town.

Shale crops out below, then
Kansan drift appears, & does
top hills.

Mr. Coleman says he boxes into
spring & after getting through
"yellow clay" (evidently Kansan)

he strikes sand & gravel.
(sand & gravel)
He says they break out on

surface occasionally
crack bottoms near 1105

Patrick Coleman.

cut 10

In the Coleman pit at 113
saw run up to 1155 ft

The upper part of the
material & some large boulders
sandier before

In upper part of the
boulders

In the pit (1110) the
shows above. Sand there is
at about 1165.

The main sand pit is just on a
level with a pocket on S. side
of creek valley, where it
looks like a sand pit. ^{this is} Butcher's pit
in sec 28.
It is also about level of the
on S. side.

Some of the sand (Kansan)
low D., etc) measure 4-5 ft.

This is a stone top.

Road (main) & bottom road
1050

Reading at base, traps
pit = 1250

The Tracy pit (cont 12)
is located in the southwest
1/4 of sec. 19 - on a ridge
E. of RR. NW. corner of 4 & 5
ft. across. It

runs rather wide with
small pits & a
few small boulders.

The sand & gravel runs
to surface on a slope, but
above it there is a
Kansan & a thin
layer.

A gray silt layer
appears in place & 20 ft
below it again. It
reaches bottom
about 80 ft. further. There
is another pit at
top of sec 19 30.

On top of Kansan
distinct & thin.

This run at least 5 ft.
to a composite layer.

53
on the side of the hill
at top of sec 19.

In place S. gravel crops out
all along.

Still further south, some
appears at about the same
(or below it to the south of the
base) of sand & gravel.

Photos 23 & 24. Looking
N. from main road
from Frankfort. Looking S.E.

Top of ridge at 19 30
Photos 23 & 24.

Looking N. from a point E. of
J. Tracy's house.

The base of exposure in Patchen
pit is 1300

The upper 6 ft. is calcareous,
thick mass of Kansan with
other boulders, sand boulders
& boulders of Nebraska!!
The lower line is rough
but irregular.

Boulders & pebbles are abundant in the sand. The sand is coarse, bedded & a lot of it exposed in light colors, - the oxidized - the (Melbourne?) sandstones are very abundant.

Took two samples of (Melbourne?) boulders.

From this side the Coleman pit looks a little lower than Butcher pit.

Coarser ferruginous sand appears lower down in a gutter (10 or 12 ft. from top of sand).

Last reading

Top of high pt. E. of Tracy's = 1430

At 1265 ft going down there is (E. of Tracy's) in

55
Dennison) a spring coming out of sand layer - Known in boulders above. Sand in boulders, this is about 10 ft. higher. This seems to rest directly on a bluish shale.

The shale is 78 ft. higher than spring.

Top of boulder = 1275

spring

Top of shale at Tracy's house = 1250.

This is at old quarry.

13
Above this, up slope, at 1270 there is a little pit open - ferruginous sand. This is probably near top, as known

appears immediately above, & sand
is thin or life below.

Road on Gillman road at foot
of hills near 1145

1430

1145

280

The highest hill is at least
20 ft. higher

Cut 14 is an old mine
and part way of life
and 3 ft. north of cut.

There are mounds in all the
high points near Tracy.

I saw shells, fragments of
bones, flint chips & debris

along road S. of Rock creek
Kansan appears in banks.

Also, in darker soil
glau shells. At a point

1/4 mi. S. of cut 14 there is

Kansan appear in banks along
road (on E. side) there;

10/11

Kansan

The Bluffs are to the S. of the
Broken Kettle or valley and
more abrupt & cut by
white than on S. side and
rounded & scarred. Low cut dip.
Barometer near 1170 at bottom
near mouth of Broken Kettle creek

cut 15

Road 1225

top of sand in cut 1295.

This shows 4-5 ft. of typical
jointed, bluish calcareous
Kansan, with pebbles &
sand boulders.

A sharp line, oxidized, separates
the two.

The sand is slightly brownish
crossbedded, & part coarser

Cur 10

Fluorine

5.00

Below the ground level of the river
is a layer of sand, which is covered by
all the surrounding vegetation.
The river is very shallow.

At 1250 ft., highest pt.
in road 2.5 mi. (S.W.)
there is a small pond in road.
Cliffs of sandstone (now
plainly covered where covered)
along bluff S. of Big turn
in road.

Returned (cold driving!) to
Westfield & stopped at
West Hotel for the night.

The river topography, as prominent toward Sioux City
is distinct up to Big turn in road, & then gradually
disappears northward.

Sept. 10 (Saturday) 1910

Left for Sioux City at 8:00 am

Reading at depot at Westfield this
morning = 1425.

In high bluff toward upper end
(^{upper} Burlington Bridge) coming into
Sioux City I saw Rowland
high up in the bluff.

Landed at Sioux City at 10 am.
Visited Mr. Healy, got mail,
purchased plates, etc.

In afternoon went out to
North River site.

At strong point - just at head of
Big Sioux river - following
follows:

River level = 1200
Road = 1220.

Top of shale in cliff 1300
Evening (top of) 1335.

The loess rests directly
on the shale here, except
that there is a heavy layer
(probably loess, but yellow)
about 1 ft. thick, grading into loess.
Great clouds of dust rise from
bars of loess in distance.
Top of highest point above (+
8.0) cliff = 1425

In Talbot's:

creek bottom = 1285
Top of calcareous shale = 1395
Top of loess hill NW. of Talbot's
home = 1495
Top of next rise = 1515

Top of sand in Talbot's pit 61
1415

2 ft. top of exposure there
are large boulders, - granite, etc.
Q. etc.

The bank is here pumiced sand
or less but above the sand up
4 or 5 ft. I could see pebbles
with calcareous joint clay.
This is clearly Kansan.

The sand in the pit is
feruginous.

The lower limit could not
be made out, but the sand
can be found at least 20 or
25 ft. down. There is a
thin layer of loess.

Miss Ruth Richetts

Melhuot Farm

Box 143

Sioux City, Ia.

There are other pits to S.

Mr. Hardy has a pit near W. Farmer
(N. of Voluntary Row)

At 1365 on off side
of ravine a spring comes
out - about 10 ft
at least 6 ft can
be traced in
in bank.

Several springs come out
on the W. side (below pit)
one in bottom of ravine
great mass of iron ore, etc.
There are nearly as
same level as the
spring on E. side (one
which supplies house)

On E. side above there
great bouldery of iron
There is sand (ferrous
like on W. side)

The spring & sand pit
are just N. of Plymouth

63
co. line.

Creek bottom at foot
(where house was built) is
1300.

On return - road up story
Pt. road 1275.

Took a list of names from
top of Talbot hill.

N. of house

21, 22, 23, 24, 33, 34, 15, 16, 25, 26, 27, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Was out with Mr. White
(summer season) principal of
one of the schools.

Sept. 11 - (Sunday) 1910

Reached Sargent's Bluff at 6 PM

Set barometer at 1000 ft.

at RR. at Sargent

Exposure at point near RR
shows a dark shale (clay)
below & light sandstone on
top - probably Laramie.

The top of Laramie = 1045.

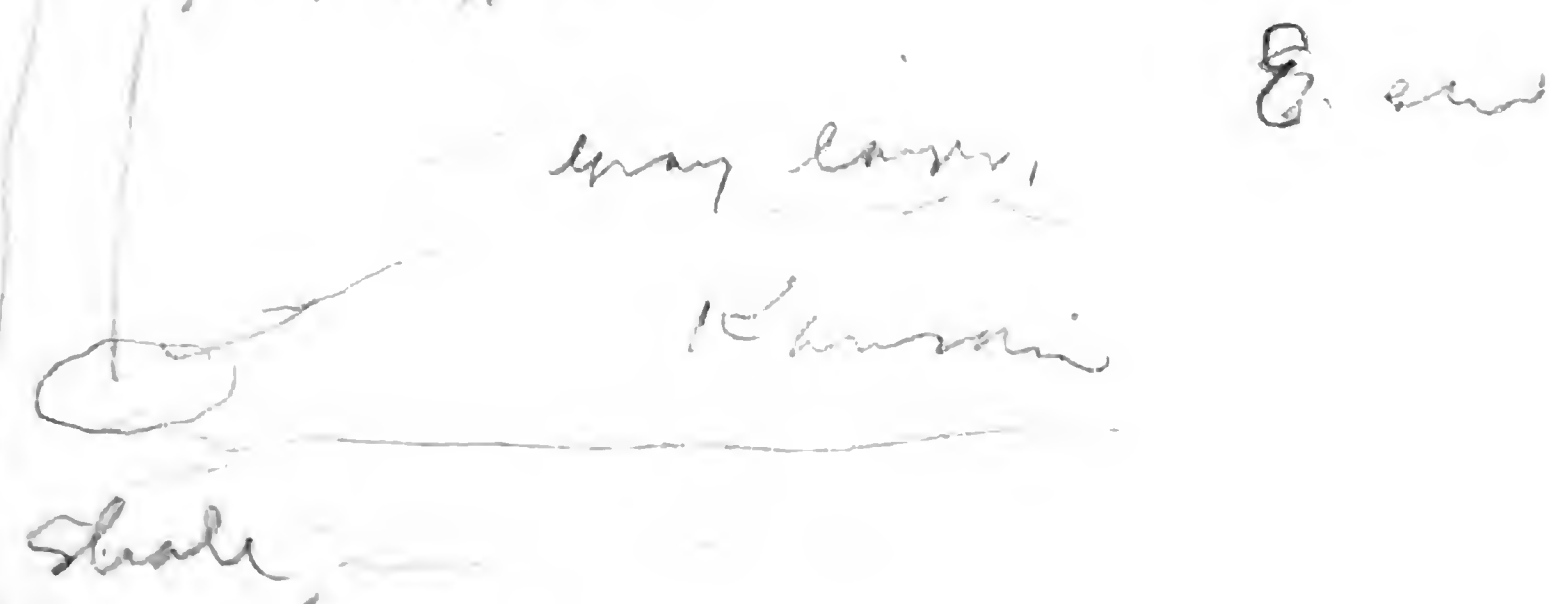
A little further S. (across river)
shale (brownish) shows up &
1045.

Above it are 3-4 ft. of

Laramie & then 5-8 ft.

of Loveland, Laramie on hill.

Loveland - looked
very fine - to sandstone.
probably cretaceous.



at W. end of S. exposure on 65
S. side the Loveland is heavily
weathered.

There is a layer of clay shale
(clay) on top 2-3 ft. thick.

Then comes sandstone 2 ft. or
more thick. It is fine grained.

Up to 1080 there is a
fine grained clay (probably
Loveland) with many calcareous
nodules on surface.

Then to top, 1110, it is soft
yellow sand.

This Laramie is by no means
the highest point.



Top of highest part of the
hill is 1180. (near school)
Top of next (NW) is 1160.
Lowest point (where
road strikes stream) is 975.
near 975

At cross-road NE it is 970

In sec. 17 at x. the well of
L. E. Wilcox

shows 60 ft. of fine yellow
clay. No sand or gravel.

The next well north (sec. 18)
went 80 ft. with same
result.

Top of highest part of ridge
between — is 120 ft. above
bottom at school.

Mr. Wilcox says there are no
gravel pits this side of
Hargens Bluff.

Reading at top of Hargens Bluff¹⁷
S. of Floyd monument 1060
bottom (near school) 930
Base of Floyd monument (on
cement base) 1010.5 ft
shaft built of sandstone.

Corner stone of shaft on N.E. corner,
on S. side this bears inscription cast
into stone:

H. M. Chittenden
captain Corps of Engineers, U.S.A
Engineer and architect.

On N. side it reads:

August 20, A.D. 1900

Madison B. Davis, Commander.

Department of Iowa.

Bronze Army of the Republic.

Bronze tablets are on E., S. & W.
sides. The east one reads:

In commemoration

of the

Louisiana Purchase

made during the

administration of Thomas Jefferson

Third President of the United States

April 30 1803 —

of its successful exploration
by the heroic members of the
Lewis and Clark Expedition
Valor of the American Soldiers
(see next page)

and of the enterprising
Courage and fortitude of the
American Pioneer
to whom these great states
West of the Mississippi River
owe their foundation.

On S. side (small tablet)

John Herr Charles
President
Floyd Memorial Association
1895-1904.
But for his persistent efforts
we should not have had this monument.

W. side.

(Floyd)

This shaft
marks the burial place of
Sergeant Charles Floyd.
a member of the
Lewis and Clark Expedition.
He died in this country's service
and was buried near this spot
August 20 1804

Graves of such men are fitting shrines
shrines to no class or creed confined.

Erected AD 1900

By the
Floyd Memorial Association
aided by the United States
and the State of Iowa.

Alt at base 920 ft. 69
Probably 40 ft. above river.

River is 880

Rock is a coarse sand near
water level (see fossils for
confirmation) some in the

The high level of the
heavy joint clay, the
even above

at S. end this very sharp,
is even steeper, - Soil runs
along joint clay under loam.

The great sandstone rock,
as shown in several large
cuts above Floyd monument
(up the river), seems to be
yellow loam, though the lower
part is very coarse & crumbly,
Loveland.

Sept 12 (Monday) 1910

Left at 6²⁵ am for Permian
over new. through West Fork &
gravel pits. The bluff all
along at 6²⁵ ft, color blue, yellow
loam and buff
along road in sec. 25, gravel pit
gravel shows more in lower road
in the knolls

at road. bottom below
flyder sand pit, reading = 1035

The flyder pit is located in
bluff E. of road, & its top
(on sand) reads 1095.

I find Kansan at & above
1095 in bluff (just E. of pit)

There are boulders & silt in
narrow band cut into road
& above that 15 ft of yellow loam

a little Kansan is obviously
just above sand (small (lower
layer) in pit.

Pieces of sand-plaster are
washed out

There is no water in sec. 23.

71

This has all the same
more or less, but the
clearly of Permian sandstone
Kansan sandstone
The lower rock flyder pit
shows as a pit 75 ft. in
depth & is filled with
sandstone. The
flyder pit is at this point

Large sandstone at this point.
This has a variety of sandstone
as well as some thin

The Sangre pit, just
up. is a coarse, silty
gravel pit on side of hill

The lower flyder pit is on the
west side of the road in the
SW 1/4 of sec. 31, West Fork.

It runs up to road. The reading
in the road is 1030.

The material is sandstone
feruginous gravel, with a few
boulders

about 8 ft. irregularly exposed
This is the usual bench. Loam on hill,

An old pit had also been
worked above the road a little
further up, - but probably
ran out upward.

Found *Silphium laciniatum*
with root 6 ft long, perfectly
vertical, in gravel pit. It
had been cut up.

Bottom at Holly Springs 1030

Top of sand in hard pit -
1000.

There is no sand where
cut, 1085.

3-4 ft of distinct calcareous, gray,
ferruginous. Tann Kauron,
with few pebbles rests
on a silty-sandy part of
Aftonian & Kauron & very
calcareous (nodular) near
line
Runs on hill above.

Lower down a ferruginous gravel,
mixed & irregularly stratified, is
worked for the gravel.

73
This is sand & gravel, in which
pits in the sand.

Worked a small pit from the
cross bedded sand & gravel under
a high layer.

It is clearly shown it
is very fine.

There is quite an extensive terrace
on the W side of West Fork with
a low hill about on a level
with the top of the pit.
The transition between Holly Springs
& the Kauron pit is very abrupt.
Over Kauron, & the numerous cuts
along the road show yellow loess,
nodular above & (very rounded)
nodules below.

The 6th cut N. of Holly Springs (2nd
2nd mile N) shows yellow loess with
scattered fossils (see box.)

The 1st cut N. (just N. of cross road)
shows lamination below.

Drove E. & S. from Holly Springs

The Eggers pit is at a
elevation of 1105 (top of
sand). It shows - but only
a fine sand. Could

not see Kansan in this
slope, but over rises
40 or 50 ft. higher

Bottom still reads 1030.

This sand does not have
an optimum content, but
may be such sand as lies
on Kansan farther north.

Kansan shows well in road
On sec. 24 at (X) there is a
bank cut by creek (on side)
showing junction sand & gravel
with Kansan above it.

Sandstone

The gravel in the front upper part of the
Beebe pit is mixed (of the usual dirty type).
It is here at the surface & has
probably been exposed a long time. It
that all this gravel means in any
case?

The Beebe pit is located in 75
the S.W. 1/4 of sec. 24. It is
200 ft. deep. It is a down
about 1/2 in. the west of the
road.

Gravel shows in the
(in bank) between small creek to
N. & this pit.

Top of gravel in pit = 1105

about 9 ft. in depth. It is
the same as the sand in the
layer - some 2-3 ft.

When corner is reached

4-5 ft. then the sand is

the upper part of the

is. It is a fine sand.

This is good to see.

The Kansan is a fine sand,
but a lot of gravel is in it.
It is a fine sand, but a lot of gravel is in it.

Gravel is in the pit to a depth of 7 ft.

There are boulders (small) of Kansan in the
upper part (or 3 ft.)

Up above the sand run
to 1115 & has disjunct
recessed R. on above sand
now and then that it is
above that

This shows the relation well,
photos of 27, 28 (last
seen and looking at
very, up from base S.
of Loc. 100 ft.

The narrow band along the
seam, of the sand & sand
clay.

One of the finest outcrops of
the "buff" in the "Horn
effect" is that within the east
1/2 mile to the county line.

The barometer seems to be
very constant today, repeated
checks showing this.

Returned to Hornick & left at
5.55 PM. for Rodney.

Put up at the Arlington Hotel.

Sept. 13, (Tues.) 1918⁷⁷

In cutting out the
morning, Rodney shows the
glacial sand & the
Hornick sand. The
higher, more sand and silt
and pebbles are found, the sand
still being
started out on the E side of the
valley of the Hornick.

The first cut N.E. of Rodney on
the C. M. St. P., in sec. 31-86-83,
is about 15 ft deep and is
loose, nodular.

The second cut is much larger,
fully 30 ft deep, and as far as I
could see (in gulches and nearly to base)
is yellow loam, more compact below, &
nodular above. The RR here runs
about 1035

Up to the Monona line the buff
is abrupt, rough, wind top of.

Beyond that they round & are lower.

Along in sec. 19 & northward a brown
bench, brown-wood, appear. It is more
or less broken in surface, but is

is a distinct bench. The hills
rise back from it gradually.

In the SE. 1/4 sec 18-86-43-5-8-15
The road leading E. (N.E.) cuts into yellow
loess (one mile).

This is at the edge of the bench.
The bench runs 40 to 50 ft
above the valley.

Near base of bench at (x) east
of the cut road, capped with a
thin layer of small pebbles &
coarse pebbles is exposed for
about 4 ft on the south side.
This is near foot of slope, 8-10 ft.
above bottom.

The sand is clean, even bedded
& looks like good Aftonian.

This is capped above with
a thick deposit of loess (yellow
as far as I saw).

^{May}
Mr. Dreyer -

79

This well at old house in sec. 19 (near
town) went through soft yellow
clay to a depth of 64 ft
where it found sand & gravel &
some loess.

He says all the sand is too fine.
He first went through some clay,
mixed with sand.

At the road, place near sec. 17,
he went through a whitish
yellow hard pan with pebbles
scattered in it, - at present
well about 2 ft (it was

thicker nearer the house, &
runs out down hill). The well
is rather low on slope.

Then common ^{yellow} clay - about 9 ft.

Then about 3 ft of sand & gravel,
well is now 14 ft deep.

First coarse gravel, then
rock (boulders - from first six
to water level).

The new house is in sec. 17.
rather low down on slope. Opposite it

on W. side of road & farther up
the edge of the loess, extending
to its top, is a deep yellow
exposing fully 20 ft. loess.
This loess is yellow, but below
it becomes quite bluish, streaked
with ferruginous, & is compact.
This level is an outlier.

The hard pan & yellow clay are
probably little Kansan, though
the latter may be all loess
mud.

The bench ends abruptly at
the river house.

The bluffs above are a little
more abrupt, & Kansan appears
in the bank. N. line of sec. 17, at 2
near ~~east part of sec. 8 at 2~~,
reading 1015, sand appears
on the east side in a little
road cut, & Kansan
distinctly above it.

~~It appears to contain pebbles.~~
~~& a few small boulders.~~ ^{Probably} Kansan.

81
Cut 4 is also at river house, (reading about 1000 to 500 ft. of sand)
It shows 3-4 ft. of sand under
Kansan. The sand is quite
ferruginous, especially along
line below. Below this
the next 3 or 4 little bluffs along
road W. (S. of foot cross road in sec. 8,
cut a little by road also now
gravel.

In sec. 5, 2 to 3 ft. all along
slope there is typical Kansan, with
some good-sized boulders.

Lower W. end sand appears in road with
Kansan in the bank, - at a

A broken bench occupies the angle,
bottom opposite Old road 960.

In S. part of sec. 32, Miller top.
fine sand appears on log slope.
It comes from under loess &
is probably same sand.

In the NW. 1/4 of sec. 32 Miller
top. The road runs down a
long hill. Loess appears above.
At an elevation of 1015 there
is very rusty sand with Kansan
above it.

Lower down gravel appears.
Kansan also shows on lower slopes - probably
over.

Bottom here reads 970

At an altitude of 1030
a very hard red highly
joint clay (looks like part
Loreland) lies over sand &
loam above that.

This (1030) is top of sand
gravel appears at 1018

The sand seems to slope
down hill. It probably
comes out and the mass
of loam appears below
the gravelly layers only
a band with sand under it.

Most of the sand is very
feruginous, especially up
the slope.

At about 1010 a fine
gray laminated silt loam
below gravel & sand & is
interlaminated somewhat with
them. I dug into it about
1 foot. This is like of

gray silt at the Fall ⁸³
Below this is a layer of
a till like material
called Kanran. It is ~~very~~
weathered gray like Kanran, but
is very tough. It is very
finer. ~~It is very~~
~~fine~~ (See sample)

This is just like material under
ravines at Granite, -
probably a phase of Kanran.

The E. side of the road shows
no sand & the heavy red
(Loreland like) till is the
continuation of Kanran.

The loam runs down into
a red feruginous like layer
above sand however, on the inside.

This lower stuff weathers into
exactly the same grayish lumpy
stuff found below gravel at Granite.

Saw a sand boulder in this lower
down.

Ordinarily I certainly would have
called the lower material Kanran.

In sec. 29 northward every
little hill covered with gravel
much boulders & sand.
In the new embankment, 20, 8. of my
road, a bed of small boulders, often
large down
Some of pebbles are abundant all
along the road, on every side.

Reading at Anthon (T.P.M.) 1020
on strat.

The terrace is 1005

Anthon is built on a
terrace of gravel & sand.
At edge east toward river bridge
it shows a mixed boulders & pebbles
layer above, & more a less cemented
(calcareous?) sand & gravel with some
boulders) a little below top.
Only about 3 ft exposure.

Some 500 ft., rather thin of
granite, ferruginous bands &
clouding, etc. show.

It seems that this terrace is
a little higher at E. edge
(reads 1025) & drops off westward
gradually. Surface shows it.
The hotel man says it is a

85
gravel terrace, rising a
little higher than the road.
& Chertose regions
all the road is here & north
on this terrace.
The RR runs ^{up} this terrace at
Anthon.

The Mahanoy pit (gravel) is
located at the edge, this terrace.
(there is a sand pit at S. edge)
At least 12 ft is exposed

2 ft dark jointed soil.
Then a thicker layer of mixed
gravel (looks finally cemented)
about 1-2 ft.

Then at least 9 ft of
beautifully cross-bedded gravel,
coarse sand & a few boulders.
The cross bedding is not obvious,
mostly nearly horizontal

Bottom of pit (about = level to top)
reads 1000
Top of exposure = 1015-

The Harnoll sand pit is at
S. edge of Iowa (x terrace)
It has the top joint soil (2 or 3 ft)
then 4-6 ft more gravel &
small boulders & below that
about 7 ft. of clean sand very
nicely horizontally bedded.

Along W. side of sec. 5
S. of Junction there is a
long exposure (5-6 ft. deep)
showing a terrace yellow
silty & stuff with many
small nodules. Below 6 ft
it becomes chocolate.

This is up above bottom,
(at 1075) It is somewhat
loess like, but too heavy.

Sand appears (it probably
belongs below this layer.)

anyhow there is a very irregular
bar between this & the chocolate
layer.

At school house the bank
seems to consist of Loveland (reddish)
only 3 or 4 ft high.

In sec. 7 - there is a gravel
pit (H. J. Miller pit) 30 ft. deep.
Base of gravel pit about 1045.
8 or 10 ft irregularly exposed
small boulders scattered all
through. Below there is fine sand.
Deeper down there is fine sand.
There are spings in hills.

The other common material
is mixed pebbles, coarse sand, etc.
It also contains a few Kansan
till "boulders" in other part.

Above this in the hill (a gutter
cuts in) strong and distinct
an typical Kansan, bluish, pointed,
with few pebbles & quite common.
This is certainly Kansan &
the gravel is below it!

The gravel is nearly
the top of gravel (as nearly
as I could make out reads 1055.
This is in main hill facing

5' The nice fine sand begins about
10 ft. below top of gravel.

Mr. Miller says he has found
clam shells but no bones or teeth.
Another gutter S. shows clear Kansan.
Loess is on hill.

Some of the upper sand & gravel
is very ferruginous.

Kansan shows all along Bluffs S.
Sand & gravel (mostly very
ferruginous) also show in several
places — rather low down
(evidently under Kansan).

In the pit in sec. 13 up
a.k. Guthridge
to 1035 is very irregularly
stratified, sand runs

The stripping above shows
15 ft of typical bluish,
red-stained Kansan with
few pebbles & some lime.

At 1010 there is a sharply
out of gray silty layer
with nodules (see sample)

This crumbles almost like
ash. In places fine-jointed.
At least 6 ft. exposed.

All along S. where road runs
low this whitish layer is exposed
& at lowest point at least 1/8
ft exposed, with fine sand
under it at very base of

89
bank here on lowest river

Peeking out base - 1000

Some of the upper part is
sandy.

In SE. 1/4 of same sec. is
another pit - sand & gravel
(sand & stone)

14 ft long & 4 ft deep
Finer sand than in Guthridge.

The Fisher pit is higher than
Guthridge pit.

under gravel there is a hard
layer.

Another pit in SE 1/4 same sec.
this is Walling pit.

The coarse mixed bouldery
gravel runs up to 1100.

The pit has 20 ft exposure
The upper part has strata
of the gray silt mixed with
pebbles - limy.

The ferruginous (very) sand
begins 4 to 5 below top

The upper end is well cross-bedded
& there are here & there
streaks of mud.

The sand is mostly ferruginous
but there are gray belts
below.

no bones or teeth found,
in uppermost part there are
drift "boulders".

This is a large pit.
The mixed gravel runs to
top of section.

Near Oto Kansan is
frequent in road.

The "silt bank" in sec. 6
just above Oto shows upper
tuff like Kansan (but no
pebbles), then a thin layer
of rusty sand, then gray
silt 4-5 in. & thin.

2 or 3 ft. of very dark
silt-like hard stuff.

In sec. 12 N. of Smithland, at
highest pt. in road there
is an excavation 6 ft deep

on W. side showing 4 or 5 ft. & 91
two foot Kansan with a big rusty
sand boulder.

The road reads 1170

Hills beyond rise probably
50 ft. higher.

South of this & much lower, a
cut & deep gutter on W. side
exposed (loam?) above running
down into Kansan like silt,
same as before & as S. of
anthon.

In sec. 13 E. of Smithland N. of
Smithland there is a deep
cut showing 15 or 20 ft of sand
(compact & red like below (some Laidlaw?))
& Kansan above below it lower
down a W. slope.

Sep. 14 (Wednesday) 1910.

Drove from Minner Valley to
Cox & to Foreland.

The material excavated from
Minner cut-off E. of Minner Valley,
is like the Kansan joint clay
(bluish, calcareous) but with
scant pebbles.

Visited Cox pit. Cox has bone
of pachyderm skull, showing foramen,
& wants to keep it until co. fair time
(end Sep. 30). Secured several small
bones & a mastodonte tooth.

Collected flowers in bottom &
S.W. along base of hill (S. side).

Drove south, & returned to
go up hill (S. side) with plant.

Visited J. Hoffman of the cement
works who has 3 plates (cemented
together) of an elephant's tooth.

Wouldn't part with it. He evidently
thinks there is a fortune tied up
in it.

Also received from the undertaker
a fine tooth which bears all
the Aftonian ear-marks. It is.

It is evidently Mastodonte
mammalian; & was found in the
belongings of a young man who
worked here for a short time
in the D.R. shops, & who came to
mind some months ago at Newfine's
house.

Left Minner Valley at 2:15 p.m. for
Council Bluffs.

Sep. 15, 1910 (Thursday)

Went south from Williams
on Omaha side with Mr.
Robert F. Gledhill & found
Josh Gledhill again at
Leland & Co. at
outlet of river.

Points 4 & 5 -
" 5 & 6 (found in out)

The last bit (the S. end of
Carney pit) less than $\frac{1}{2}$
a mile S. of county line
shows several feet (occasionally)
of typical dark probably
Nebraskan (pointed out)
of which I just saw low

gravel, as in 1909, probably
re-stated weathering. This
thin layer is 6 to 8 inches
deep & grades into a thin
one sample of Nebraskan
transition, & is at least 100 ft.
higher S. end of Carney pit.
This transition is exactly
like lowest layer in transition
pit, etc.

The highest point on ridge W. of
bluffs in S. Omaha is 215
ft. above the track of the RR
at the base.

At the great bend where the
men putting in concrete wall
next to river have exposed
dark Nebraskan, shading up
into rounded alluvial stuff
with a few small fragments.
This upper part is brown.
The Nebraskan is here about
5-6 ft. above the river at
very low stage.

This is at Childs' Point,
At Coffin Spring, which is
just below first canyon road
that crosses RR. (2 miles
below Childs' Pt) (There
are layers of sand, lying
3-4 ft. above RR,

On the summit next about
3-4 ft. of hard heavy
whitish silty stuff, probably
effluvia.

On this are 2-6 ft. of
sand, pebbly above, &
strongly oxidized in places.
Above this is loess, but
Lovelandian below. The
probability is that this
is a dump of stuff.

A little farther down the
slope of the same mesa I
found a thick bed.

At the next spring, 200 ft
below Coffin Spring,

97
The bed of sand is
little higher than RR.

Then 20 ft. up. there is a
bed 1-3 ft deep of white
volcanic ash (see sample)

The man says that there is
sand below again.

The sand is in places & seems
to be at least 20 ft. thick.

This volcanic ash is probably
a part of a cinder cone, & is
not unlike the sandstone
rock at the top of the mesa.

At the bottom the
material is all low at
end of ridge, showing
inclination.

This road was 2.5 miles
from 24. - 1/4 mile above
Baldwin.

This is at Parker's Point, just
below the Childs' P.

The hill with sandstone is
170 ft. above RR.

We visited one of Mr. Gilde's
"earth-ridges" which caches
on top of the hill.

There is a circular excavation
60 ft. in diameter (some of the
others are 80) and 5 or 6 ft
deep. No earth seems to
have been thrown out, but it
is mysteriously removed according
to Mr. Gilde.

There is an entrance on the
S. side, - a deep, narrow passage
way.

These lodges were evidently
occupied by several families,
and each seems to have had
a cache, - N., W., S., & E., &
perhaps others. These
caches were sunk below
the floor of the lodge, sometimes
several feet, and were covered
with layers of stone - slabs
of local limestone, & boulders.

99
Fires were always built over
them, perhaps to conceal them.
The material in the caches
is always soft and dry, like
fine dry snow, - and in
this cache there were layers
and streaks of volcanic ash.
Under the floors were bones
of birds, fish, etc. also
fish, etc. clams, etc.
These were not buried bones.
Mr. Sweden's friends were
obtained chiefly from these
caches. He thinks they
were Mandan.

He says the Archaean
(a branch of Pawnee) follow
the Mandan and live in
their earth lodges.

No grooved axes are found in
the caches, though not
uncommon on the surface.
Mr. Gilde suggests that
from types of houses at present,

evidently representing
different tribes.
He says mounds of animal
on E. & W. sides of river
were very different - those
on W. side burning bones
(more or less?).

Every house side has
fine soil material evidently
washed in & below it
is a layer (a foot or so?)
which was evidently the
earth layer on the roof -
now fallen. Then comes
floor of bone.

Collector bones (mammals,
birds & fish), shells, fish chips,
etc.

also collects a lot of
bone shells (modern) on
top of this level at edge

of house cavity. At 101
level 15 ft - all bone from
level, none from below - bone
170 ft above bottom.
This was timber & is still
so nearby.

This tract (the hills
tract at 1200 or more ft) is
very rough and heavily
timbered.

These house-sites are
common. We saw several
and Mr. Gilder says he has
seen at least 200.

We also saw what appeared
to be two burial mounds, but
Gilder says they are none
on this side. He thinks
the Mandan burials were
down low down along bluff.
At the Coffee spring in
excavating a road recently
they dug through a mound.

almost at level of R.H.
✓ found 18 skeletons

Oct. 8 - 1910. (Friday) 103

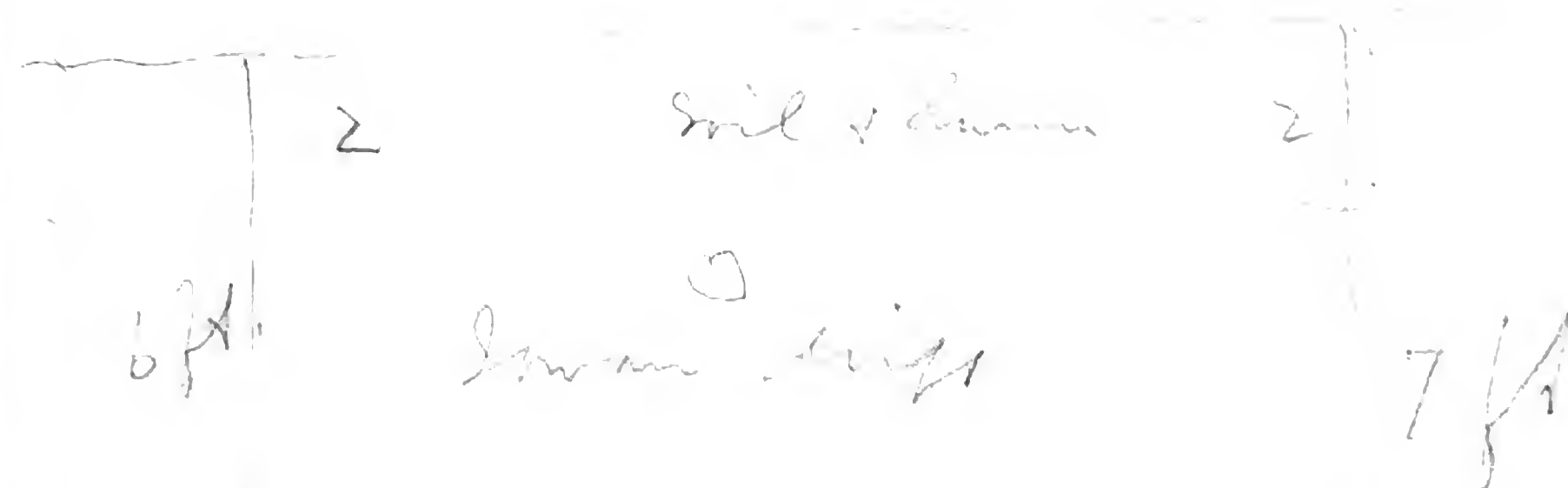
went to Independence
Dig. Column, 10 ft. x 5 in
✓ worked Independence at 7:30

From to Davis -

On 2nd level, gravel, 1 ft. on
level of R.H.

They here went down to Kama
right. On 1st level, 1 ft. on
level of R.H.

cleaner section as follows:



2 1/2 ft. Iron drift
2 1/2 ft. Iron drift
gravel.
clean cut in 2 ft. long

Took 8 photos.

The brown is a new, fine, coarse, standing up into soil. A few boulders appear in it some pebbles & occasional little bits (boulders) of sand.

The line between drift &

Brushman is very sharp.

The Brushman is here much like very ribbon weathered siltstone, ^{rather} finely stratified, with a few rotten boulders, some small boulders, & pebbles & sand. There are iron hollow concretions (looking like pebbles), also a little lime.

Took sample of drift & gravel.

There must be 15 to 20 ft of gravel.

The drift at bottom is typical Kansan, with large boulders. (Says Prof. Calvin).

Some of the big boulders dropped down from above.

Continuation in fact the

same things but & only the lower part of them.

But a few big boulders above.

Nov. 11

RR. to Iowa City	.00
RR. to Sioux Falls	6.25
Breakfast (Orleans) Exeter, etc.	.50
Dinner & Supper, Exeter, etc.	1.00
Living, Exeter #4361	2.50
RR. to Exeter	.62
Nov. 12 Teams, 2 trips, Exeter	4.00
RR. Fairview to Westford	.84
Exeter Hotel, " "	.50
Team to Ridgely #4363	1.00
RR. to Hawarden	.37?
Hotel (depot) Hawarden (room)	1.00
Nov. 13 - RR. to Sioux City .84 +	
to Omaha .76, =	1.60
Breakfast, Arcade Cafe -	.25
Team (Hicks) to Grain	1.50
RR. to Mt. Valley	.77
Lunch - Range Creek Inn	.20
Team (Cox's)	1.50
Supper - Miller Hotel	.50
Dray - barrel -	.25
RR. to Cedar Rapids	4.90
C.R. to Iowa City	.50

31.05

Nov. 11 Friday 1897

Left Cedar Rapids at 100 am.

A spirit like a man & woman came aboard. The woman had yellow hair (curled like a nest of bees) & she was dressed out in style & aristocratic in bearing. Her face was pale & smooth, but she put on airs.

She had a dog which was given a seat beside her in the chair car & the husband had to flock by himself.

Big cement plant & large shallow sand pit just E.

Libbey - N. side RR.

W. of CRD & P. & N. of

Shindler. The stream is flat, to the east the

"moraine" runs down northward, & is continued

Reached Fox Falls at noon. Took dinner at Jacob's hotel & drove east.

From road going E. we can see that the Big Sioux valley has been gouged out of a great plain (Kansan) nodular lens in road along 1/2 mile E. of town to north.

With samples of nodular lens along road, middle of N. line of sec. 18 - E. of Fox Falls.

On N. line of sec. 17 there are two cuts in road across ridges. The W. shows about 8 ft. of yellow loess nodular about 2 ft. & with

very many

good (Kansan)

The E. cut is similar, but unfractured (yellow loess) as are other cuts between

the country road and up to town to river.

Good (Kansan) this (yellow) rolling Kansan.

Two more (Kansan) station out of 2 ft. (Kansan) at top of 2 mi. cut (Kansan)

(These two cuts are on the N. side of the N.E. 1/4 N.E. 1/4 sec. 17 - 101-48.)

a series of low ridges for
a short distance.

As we approach Sixx
falls the country, still
showing drift on surface,
becomes much more
rolling.

In places red boulders
cover slopes.

This rough area
seems to begin just
about at county line,

(This should go
back - May two
pages)

In the 1st (west) canyon
at the base of the Kaibab
mtn. range.

E. of base of E. 500 Falls on
E. 5 (510, cor. 19-101-48)
lower part of (Kaibab
is a series of (a)
there are feet above

Baileys, granite 100 ft. above
above the lower - calcareous
at 400

About 3/4 mi. ^N of same
(near S.E. cor. SW 1/4 19-101-48)
cross road: 7 ft

of lower beds in row end
(high count - 100 ft)

Below this, (part way down
slope to W. is a distinct
layer (about 1-2 ft) of
fine brown with coarse
iron tubules

Below this is a drift, strongly
oxidized above.

Young of the same

3 mi. S. of same

This is the point

7 mi. S. of same

(about 1/2 mi. S. of same)
(510, cor. 19-101-46)
mule

cross road: 10 30.

(3/4 mile W. of same, just
right.)

1/2 mile W. of same

W. of 2 mi. S. of same

(510, cor. 24-101-49)

Road at base of same

2 mi. east of same

(near same)

Upper end of same

at Jell. Cor. 9 5

Jell. Cor. 12K (near

collecting) 90

RR. tracks on same

= 945 ft

The barometer was
steady today.

I called on Mr. A. Collins & borrowed the "Stone tablet" which was found in this pit, ^{the location of} and which is described in my notes of last summer.

Garry S. from "Birds"
on Chest P.

Av. San Fall 925

703

4/20 980

Zhen 936

at Harrisburg 9/10

28 870

55

830

785

Can'tor 705

Reached Canton at 8 pm.
I met Bro.

Nov. 12 - Saturday

Grass N.E.

U. on E side of slide.

John

From the 865

Exp. Station 350

Top, Molar S 45

Perls

1. Human joint can $12-24^\circ$

2 Very heavy calcareous
silt 1-2 ft.

3 Crum. with sand
7 ft

4 Calcareous shale 2-4 m.

5 Melrose

No. 1 - Lawson

Only about 2 ft exposed -
It is a blue, granular, calcareous material, some on the slope blue, some brown.

Lies on very soft

No. 2 The soft layer is
white, very calcareous &
contains angular shells.
It is 1 1/2 - 2 ft thick &
shades down to sand.

No. 3 - The upper part of
the apterian zone has
numerous calcareous plates
(w/ft) alternating with sand.
Some of the shells are
in lower part of soft where
it is sandy.
The sand is beautifully
cross-bedded, with a few lines
of pebbles, & ferruginous
streaks, especially below.

No. 4 is a series of calcareous
plates, not more than 1/2 in.
It is a same as No. 2, but
(see sample 1)

3-6 in thick, dark heavy joint
No. 5 clay with pebbles & a
brown zone, it is certainly
Vesuvianian.
The upper part of it is
No. 4 & 5. about 3 in.

No. 6 is a brown sand 0-4 ft.
This runs down into the
water, it is a brown
sand, but it is not
uniform, & it is
exposed all the way
down.

So up of all 170 ft
& further north the bed is
probably 15 ft higher.

To left another
← around corner
back

Karman

24

3

五

Wichita

1000

119

Spring

Marine Biology V

— 22 —

77

[Faint handwritten notes at the bottom of the page]

Ther. 7th March 1881

Contains copy No 1

Richardson

Top of Mammals as
at 755

Top of Mammals as
795

Top of Mammals as 816

The Mammals. This
part is a general group
bluish clay with small
boulders of quartzite.

Bottom is 725

Heaven

Mammals = 60

Afton = 10

Kam = 15

55

179

121

Starts S. at 12:30

The rough ground is a Mammal

its top is 800. This is

the top of the Mammals.

The Mammals are in the

ground, and are

exposed.

The Mammals are in the

ground, and are

about 770 - 780

about 770 - 780

Kam is 725, 730, 740

The Mammals are in the

ground, and are 160

W. of the Mammals is 840

from the Mammals 910

" " " " 920

This is the Mammals, and is 940

and the Mammals are 940

and the Mammals are 940

The slide also shows a
great
dipped at about 12-14

12 ft



on the north side.
The drift
top is quite yellow
(see sample).
But I think it is Kansan
This is in W. 1/4 sec 12-
97-49

The slide indicates
Aftonian below,

Top of slide to S. = 750 123

It is a ledge of (S. 123)
There is a bed of sand, 3
feet at S 75
29 ft. thick, mostly
horizontally bedded, & a
big hole is bored out
in great sand & gravel
(3+ ft. deep) in the
face of the sand.
Kansan above,
about 3 feet above
Kansan shows above now
in cut, & above on
slope are sand &
pebbles.
Could not make out
lowest member.
The top of Aftonian is
905 & the line is very sharp,

all along middle of
about 815 - 820 there
is a small
little great things
coming out from
it.

The spring is on
great plateau to the north.

Top of hill where road turns
west is 1005 ft. The top
here has massive yellow loess,
probably not more than 3-5
ft.

Loess all along road, but
Kaolin shows on lower slopes,
loess probably rather 700 ft.
in places.

At SE cor. of sec 13
there are two loess -
the blue loess extends
about whole height - at

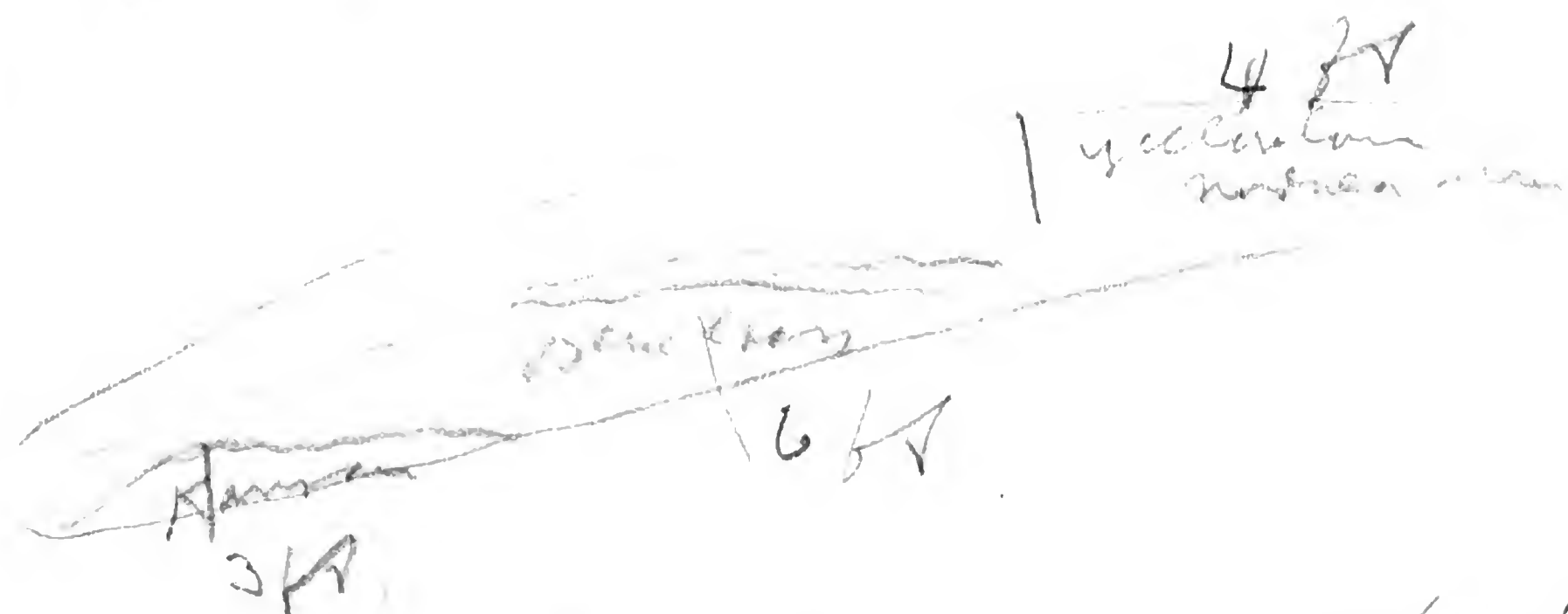
127
a foot or two
some
turns down with
some (blue) &

The first cut east shows Kaolin
2nd cut shows loess 1-4 ft
blue loess some & some
& on this 1-3 ft. yellow loess.
The 3rd cut - just at end
of first 40 a. shows
all three members.
Two more cuts in next 40
show same
next 4 miles shows 2 cuts,
the same.

In next 8 miles only 1 cut, within
a few rods of 2nd cut, and 8
here Kaolin & 2 loess shows.
All along road there is
sand (yellow loess)

The highest pt. in the next
mile (highest on plateau) is
1060

In sec 22 - a very cut line



The two are separated
by a layer of sand.
The lower & Kansan
sharply reworked

840 is top of Fairview
bench.

820 RR. depot.

The plateau which we ¹²⁹
crossed along road S. of
Fairview is rolling, high,
a level with the plateau,
& the heavy timber on sides
along river does not
at all. The
yellow loess covers all, the
upper part very nodular.
There is much blue loess
& Kansan. There are several
points on lower slopes.
At turn of road before
(or just at) going N. to
Fairview there is a good
exposure of fine Kansan.
Left Fairview at 2¹⁸
for Westfield.
Mr. West took team
back to Canton.

Reached Westfield at 3.42
and at once took team &
drove to Richland, So. D.
At the point of view I
found Crataegus (a 20 ft
limb) rising about
20 ft. above road, on the
E. & S.W. sides of the point.

Drove N. along road over
the ridge, and found yellow
nodular loess in some cuts
as I ascended. I could see
no drift.

Returned to Westfield, took
messenger, and left at 6.40 PM.

for Hawarden.
Put up at depot (C. & M. W.)
hotel, called on Stone's.

Nov. 13 - Sunday¹³¹

Left Hawarden at 3.30 AM.
via the new C. & M. W. cut off.
Reached Quawwa at 7

drove to Tiffin, I. & J.
barnyard & millstream
both at 100 ft. above road.
2nd floor of barn, all
one column.
Vanderbilt post.

There were also about:

Loess - 10 ft.

Karn. 1-5 ft

Gravel 2-4 ft.

Iron-laden yellow loess -

about 10-12 ft?

Then white loess 4-6 ft

Layer of silt & below it mostly

sand & gravel - total 4-10

in. (silt about 1 in)

Below that white loess.

3 ft.

But at S. end of road at
base - from this ground
come bones.

White sand has clay nodules
& many fragments of
shells.

Return to Panama, at 1 P.M.
& just made train
Some old delay by same
old grumpy agent.
Complained that I was late,
& I had been standing at
the window for some time
waiting for him.

1892. 2. 1. 2 P.M.

133

Y. L. L.

Handwritten notes in the bottom right corner of page 133, including the word "Panama" and other illegible cursive text.

Account

Nov 24 - RR to CR.	.50
" 25 - RR CR to Denison	4.02
Basket for bones	.35
" 26 - Hotel Denison	2.00
Bus	.25
RR to Co. Bluffs	1.30
Supper at Royal Cafe	.25
Car fare to hotel	.10
 " 27 - RR Co. Bluffs to Ia City	5.24
Supper en route	.50
Bus Iowa City	.25
	<hr/> 14.71

Nov. 24th 1910 (Thursday) 135

Left Iowa City at 9:30 am

Nov. 25th 1910 Friday

Left Cedar Rapids at 12:05 am
 Reached Denison at 5:30 am.
 Went to Denison Hotel.
 Night room main hallway has
 a fire escape below main floor
 works one way (down) and
 west of depot (up) (see sketch)
 Also says there is a fire near
 Ill. Cent depot right in
 town.
 Saw a house at 1st & 4th
 Deloit - 7 mi. north.
 Went out to look at the place
 of place where the
 side of road, in a
 Cent. RR right (200 yds
 from it) is a
 sand pit,
 the sand is rather fine,

stratified & somewhat cross bedded
about 100 ft. thick
There are usually small
(narrow)

There are also some small
ones of a different

Also some small
After they are done, from

some of the small
of coarse pebbles
Pebbles, some are small
& some are large

One part

stripper

Thin sand

pebbles

Sand.

There are small concretion
with the pebbles.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

16.

17.

18.

19.

20.

21.

22.

23.

24.

25.

Just about
45°

Things
real angle.



Just about
45°

4 ft
 Limestone
 6 ft
 10 ft

Reddish
 sand 2 ft

Wack

6 ft

RR. at foot of hill 1/2
 mile
 100

Went to hills and
 pit between RR. &
 me on S. side of hill.
 From this place
 gravel & sand. Does
 not show in bluffs.

141
 Reddish
 sand
 2 ft
 Wack
 6 ft
 10 ft
 RR. at foot of hill 1/2
 mile
 100

cut

S

This cut shows a fallow;
15 ft.

188 ft. from top of (cut)

cut

Red gravel &
sand (cut)
much (cut)

grade

bottom of
the cut.

cross by
the river
(a bump)

cut.

The gravel near the
boulders in it. No
solid boulders.

There is a great slide along
S side of river S. of Devision.
This needs attention.
The pits at Deloit are
evidently along the western
branch of the Boyer.

Nov. 26th 1910

Left Denham at 5:17 am &
reached Conn. Bluffs about 7:30
Took breakfast & from Mr. Peck
at high school.

Found bones and teeth, & then
will be washed.

Took lunch with them, then
visited Rogers & the Jenkins,
now Kirk (Dr.) Jennings. Then
to Miss Rose.

also Mr. Bender who takes
Thomas' place in Bluffs.
Thomas son & Sheldon
called on Wickham Bros. They
are working the upper & pits
you can find one.

Visited Wickham Bros.
E. A. Wickham -

(send paper.)
will have bones

In evening went to Gales & got
shells.

Then visited Rev. Borg at Rev.

Udink's with them &
Harrish.

Nov. 27, 1910

145

Nov. 27

Nov. 27

Nov. 27

Nov. 27

Nov. 27 15

Nov. 27 8

Nov. 27

Nov. 27

Nov. 27

Nov. 27 15

Nov. 27

Nov. 27

Nov. 27

Nov. 27

At a point about 1/2
north of town, & near road
to level of R.R. is a small
blue-black lake
little water, (about 4
exposed) & is a fine
spot for a house.
The water is very
receding, & the
mud. In the middle of the
there are some small
clumps, coming out of the
fine water at the
Water runs over the rocks.

147

The river runs
 north to south
 through the
 center of the
 section.

There is a
 great deal of
 material
 there is also
 a lot of
 gravel
 at the bottom

of the river
 along the
 side of
 the river.

The river runs along
 the - 3 blocks N. of W. line
 at top of hill on corner
 149 to bottom of river.
 They struck under sand &
 some gravel all along
 under hill.

The river runs
 north to south
 through the
 center of the
 section.

There is a
 great deal of
 material
 there is also
 a lot of
 gravel
 at the bottom

river

W

W

on return at 32 a day. elevation
= 1115.

Hand-drawn sketch map of a road layout. The map shows a main road running vertically, with several branches and intersections. Key labels and measurements include:

- Top Right:** "151" written near a diagonal line.
- Top Left:** "1155" written near a horizontal line.
- Top Center:** "425" written near a small square marker.
- Right Side:** "42nd" written near a horizontal line intersecting the main road.
- Bottom Left:** "450" written near a curved line.
- Bottom Center:** "205" written near a small square marker.
- Bottom Right:** "110 paces" written near a horizontal line.
- Bottom Left:** "36th" written near a horizontal line.
- Bottom Right:** "Row" written near a horizontal line.

The sketch is drawn on a piece of paper with a vertical crease. The lines are hand-drawn and somewhat irregular. There are several small square markers along the main road. The overall layout suggests a plan for a road or a survey of an existing one.

The upper line of the
Cleveland uniformly follows
the vertical contours, & the
present surface, while higher
was determined in its contour
by the old time Cleveland.

The loess is here quite
uniformly a series, though the
blue loess varies in thickness.

The strong lamination at base
of cuts suggests that the base
of the Cleveland is not far away.

It ought to be easy to
determine (by boring) whether
Kansan or Aftonian is under
it.

These are the finest sections
of Cleveland which I have
ever seen. This should have
been called the Aurora!

153
Left Cornish Bluff at 6²⁵
P.M. for home.

Dec. 21-1910

Left	
Irma City to Fairfield,	\$ 1.61
Transfer "	.25
RR. to Hamburg via Red Oak	4.54
Breakfast, Evans house "	.30
Hamburg - train	2.50
RR. to Langdon (2)	.90
RR. to Rock Port (2)	.50
	<hr/> 10.60
Livery - Rock Port	2.50
Hotel - Rock Port	.40
Back to Langdon (2)	1.00
RR. to Co. Bluff	1.45
Wells cafe - dinner - Co Bluff	.30
" " supper - "	.25
RR. fm Co. Bluff to Ia. City	5.24
	<hr/> 21.34
	.40
	<hr/> \$ 22.74

Dec. 21, 1910 Wednesday

Left Iowa City at 6:15 AM via
train. Reached Fairfield at 11:35
AM (arrived in Ia. City).
Left Fairfield at 12:41 PM +

Dec. 22, 1910 Thursday

Reached Red Oak at 6:20 AM
Took breakfast at Evans house
Left at 7:00 AM for Hamburg
at 7:00 AM

The country between Red Oak
and Shenandoah is typical
rolling prairie back from
the valley.

The slopes eastward are
very gentle & hills low.
Westward they are higher

and more abrupt.

Dr. Geo. L. Smith joined me at

Shenandoah, Ia.

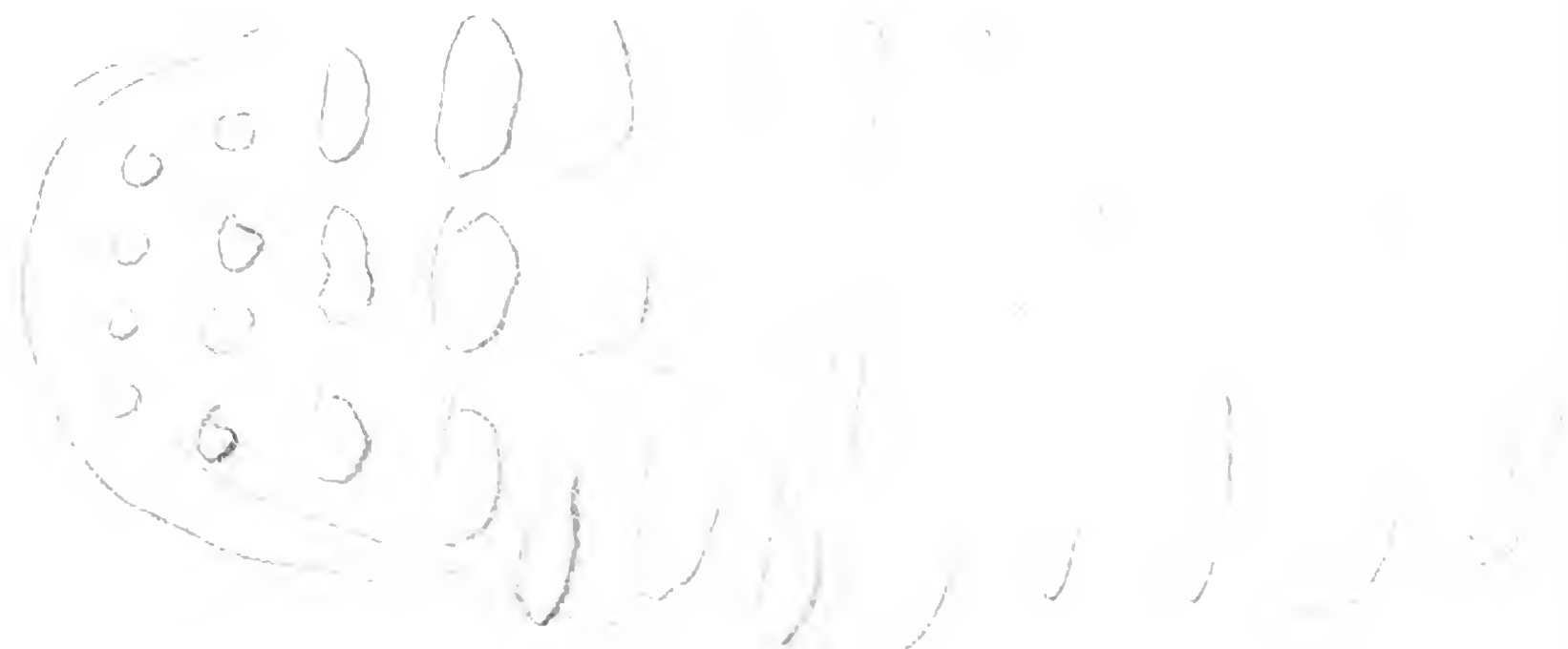
Visited farm of Wm. Savage
Hamburg, La.
W. of Riverton (near W. end of r.r.)

23 J-68 RXLII

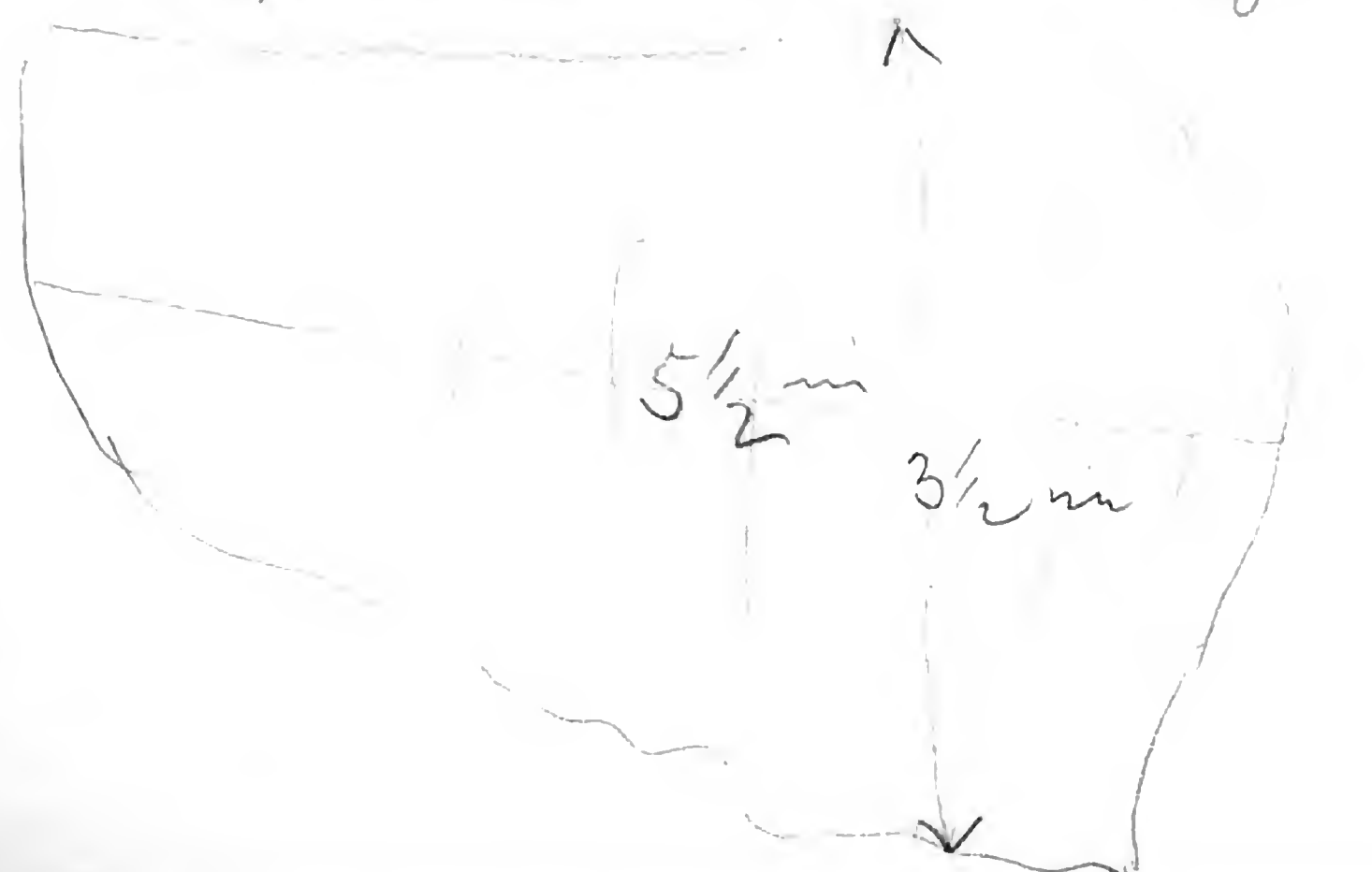
The two specimens of teeth are
Elephas -

Smaller teeth shows $11\frac{1}{2}$ (or nearly 12)
plates in 4 inches.

7 plates in $2\frac{1}{2}$ inches



Material is heavy.
+ typical Aftonian



Larger tooth

5 plates in 4 in.

Material is heavy, broken &
heavy. Not in good shape
for identification.

Both were from same locality.

The upper teeth show three
rows of plates, the lower
show two rows of plates.

The upper teeth show three
rows of plates, the lower
show two rows of plates.

The upper teeth show three
rows of plates, the lower
show two rows of plates.

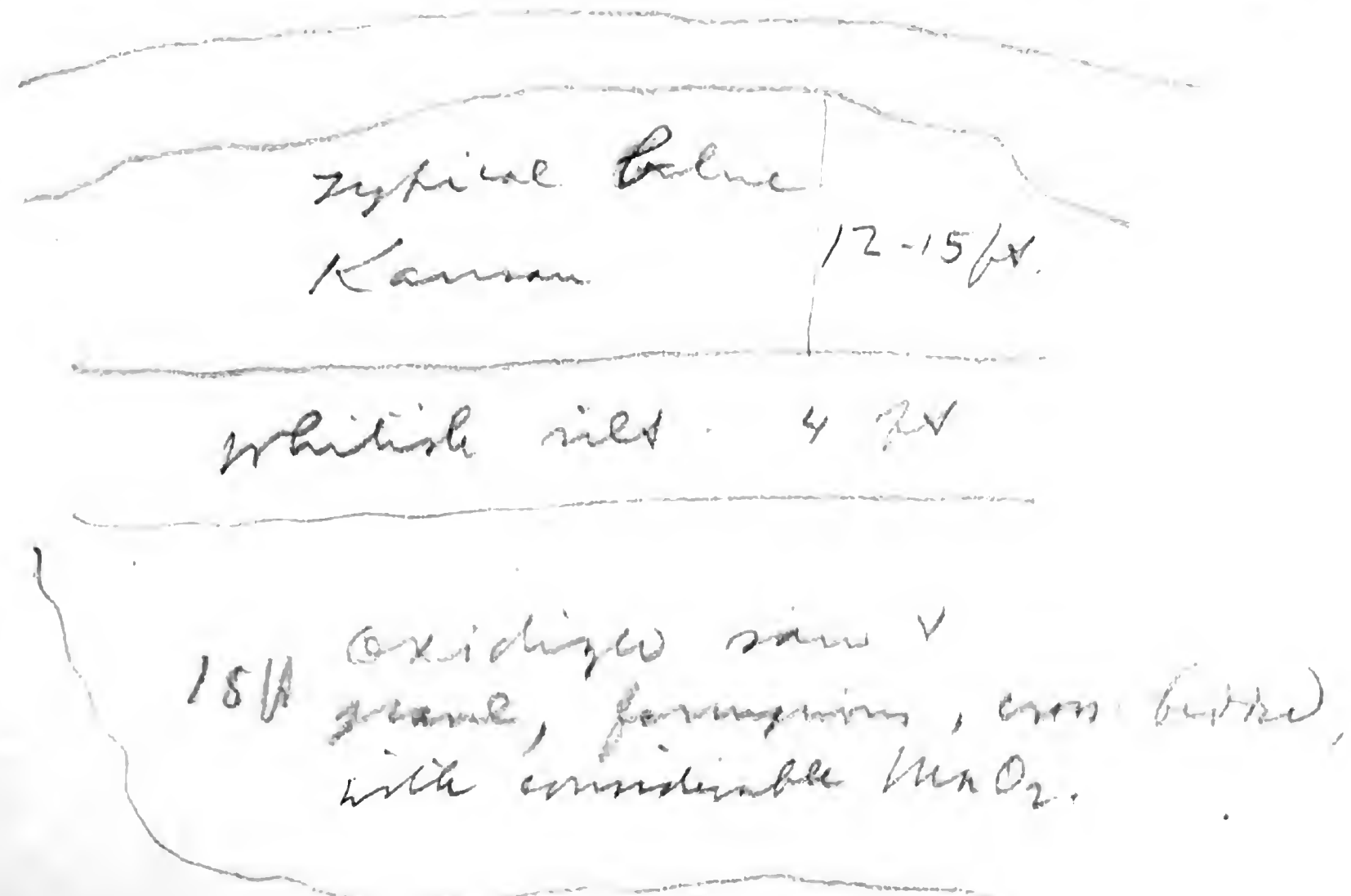
Returned to Hamburg and
took train for Bay Lake and
then went by the ferry to
plug to Rockport.

Put up at Hotel Southern
There is much blue loam (thick) with
iron tubes) shown along road to
Rockport.

Drove to James M. Whitham's place in sec. 22-64-41. about 6 mi. south of Rockport - just at edge of bluffs.

The Whitham gravel pits, - he works two close together, - are located back in the hills a short distance, and the base of the gravel, or top of cap rock lying just over a thin vein of coal, is 70 ft. above road on bottomland, & about 75 ft. above general bottomland.

The north pit, facing North, is as follows: Photos 344



Took photo 344 of N. pit -

159
N. on page

↑

near view 2/422

Kanran 12-15 ft.

Whitish silt 4 ft. nearly level

oxidized sand & gravel. 15 ft. to cap rock (22 in.) above coal. Much MnO₂. Contains bones, teeth, etc. Found fragments of clam shells.

Photos — — Same.

Took photo of S.W. pit, looking about N.W.

Photos 15-16.

Loamy loess.

Lowland 4 ft.

mostly calcareous, with
few pebbles, & small bones
some iron tubes etc.

Blue loess

Chocolate colored loess

Sandy silt (white) loess - 2 ft.

11 ft. 6 in.

6 ft.

Excavation in loess

5 ft. ground.

Glaciers.

slump
H. 10

The line between the loess and
Kansan is sharp, & slightly
irregular.

The lower line of the Kansan is
about horizontal.

At base of bed of loess there
is a layer of boulders - not a
continuous sheet, but in patches.

Examined bones and teeth at
Mrs. Whittham's house.

He has a few small bones & teeth
bones, & a buffalo horn - from

slump, or loess - quite modern

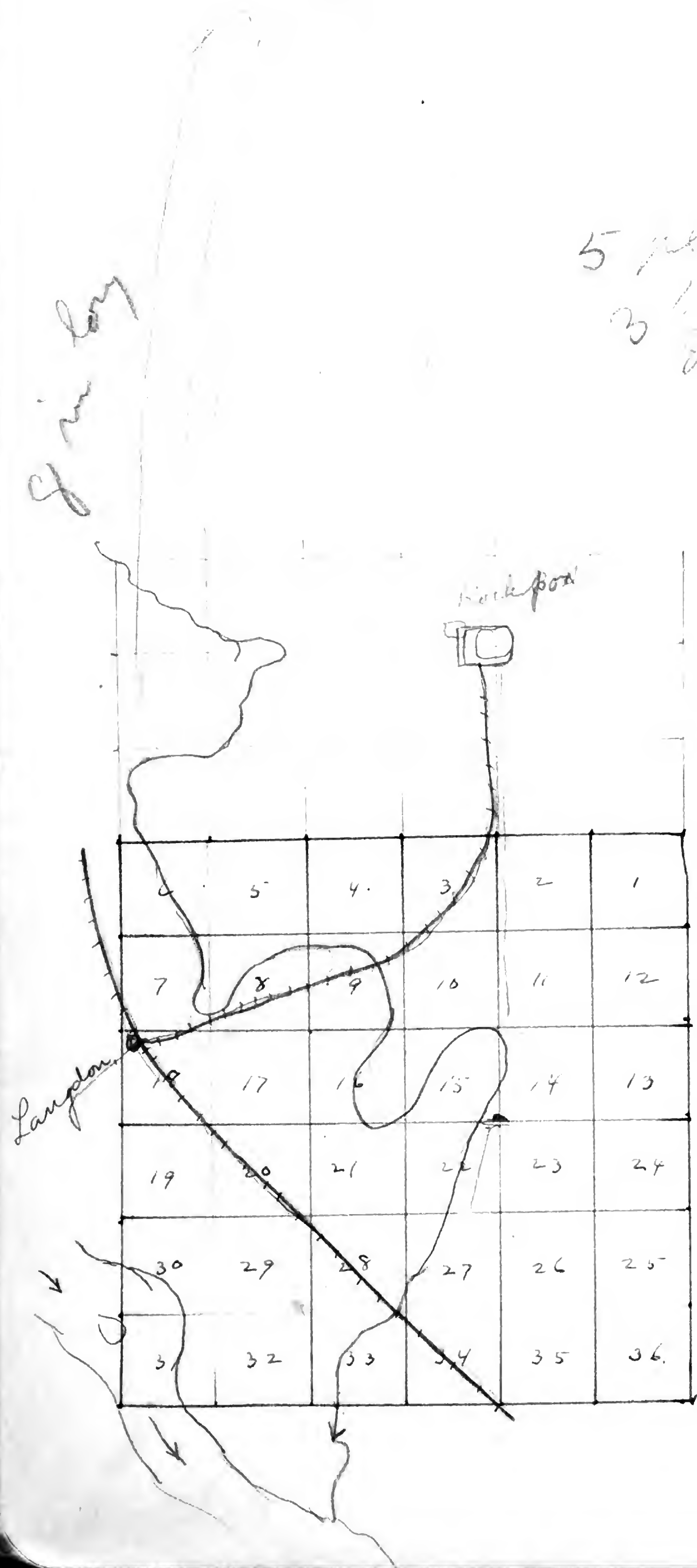
Also many bones of loess
bones. Horse bones

Also several horse teeth, etc.

also examined material in
Atchison County Jail office.

Two pieces - 1 a buffalo
tooth, - not of loess.

The other is a part of
Elephant tooth



5 plates in
3 1/8 inches

On N side of sec 22 - 3 1/2 miles
long, mostly ...
less than across a 40a. E.
the road cuts through top
of ridge.

This is yellow loam, with
bluish loam ...

Fossils from yellow loam
(see box)

F. C. Greene
Mo. Geol. Survey.
was first to see the
Whitham pit, but
did not recognize the
importance. Dr. ... Smith
did that.

Dec. 23 Friday

Left Rosh Port by boat for
Langdon at 7³⁰ am.

Left Langdon at 9¹⁸ am
for Cornhill Bluffs.

Opposite (above) Western Point
is a great crescent meeting
east. At Little Point there
is exaggerated wave topography,
but middle of crescent has
low rounded bluffs.

Dr. Geo. L. Smith left me
at Hamburg.

Left Co. Bluffs at 5⁰⁵ pm home.

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Oct. 2-1910

Drive W from the cabin
at Mr. Will's house, at center of
sec. 6 - $3\frac{1}{2}$ mi. west, the old pit
(W. of barn) is covered by RR., but
he has opened a new pit on the road
W. of RR.

In sec. 11. Scarcely six drops
S. of road there are deep
ravines & sharp ridges.
At X near bottom of ravine
there is very heavy bluish clays
(see sample) - This is in bank
A little lower down stream a
softer gray silts & then gravel above,
the last is probably soft loam, - the
light Kansan, though very thin.
Above the latter, come alluvium
of the slope water scaps out
of sandy clay, & still above
that yellow sand shows in gopher
heaps. This is evidently Illinoian
Collective form, fine, silty, shaly, etc.,
Many - fine - deep layers.

2 in sec. 11 is a fine silty
clay, with up many shales
part of it is a light brown
clay, Kansan on the side.

Illinoian!!

See sample of silt
The silt is not very
abundant, but is in
places.
see sample of silt
see Illinoian sample
taken 20 ft. above road.
The Illinoian is a ^{rolling} $9\frac{1}{2}$ mile
joint way with few pebbles
Silt bank about 2 ft. deep
further down slope Kansan
appears below it.

RR. cut no. 10 - Seventy Six 200 ft
this is E. of overbank line (the
last part of it). The water on
the interior of the cut is

- 5 } 6-8 ft yellow fine clay -
weathering brown red.
- 4 } 6-8 ft laminar sand - yellow - with pinkish
fine. Laminar sand - Probably water
fine. Laminar sand - water fine sand
- 3 } Bluish red, 1-2 ft
- 2 } Dark yellowish blue, 3-4 ft
shades into red below
- 1 } Red joint clay with
fossils, 8-10 ft.

See samples of all.

- No. 1 is very red & shows joint
structure & few pebbles.
No. 2 - grades into 1 & is more
fine. Line between it & (3)
is sharp.
No. 3 has oxidized line above &
below.
No. 4 - shows lamination where weathered

There seems to be no real cross
bedding.

On S. side of cut a small
creek cut 1, 2 & 3 are
observed by others.

A short distance north
down the stream - the stream
is called Nelson's? (or is it
Kanan? a small range), above
it a stream named Kanan,
above that Kanan. Then
Kanan & the stream to west

The stream above it is
are yellow RR. which
has some life.
Took sample of Kanan.
Spring run out below Kanan.

N. into
cut in sec. 10. just S of roadcut



~~RR~~
~~cut~~
cut.

W cut end of upper sec. 10. just N.

4 same
end
new oxen

RR

70 ft. deep



Just S of the roadcut
cut in sec. 10. just S of roadcut

The 3rd & 4th sec. just S.
cut in sec. 10. just S of roadcut

cut in sec. 10. just S of roadcut

The cut in sec. 10. just S of roadcut

Photos 27 & 28 show 10 sec. of
main cut of sec. 10. just S of roadcut
Photos 23 & 24 - 2nd cut - looking
west.

side
road
ice.

Kansas

Photos 11 & 12 - Road along RR
trees down

What I call ^{see samples} ~~thin~~
darker, but a ^{very} ~~thin~~
spot in the ~~thin~~
ice 15-16' ~~thick~~
the ice, is yellow, ~~thin~~
much ~~thinner~~ & ~~more~~
pale, ~~thin~~ & ~~be~~
more ~~thin~~ ~~thick~~, ~~thin~~

Thomas E. cut gutter into
down & exposed several feet
of red sand & pebbles on
a heavy green silt (all
sample)

near center of sec. 35, Lake
drop there is a ~~thin~~ ~~thin~~
6. mile of road showing 5-6
ft. of jointy clay, some ~~thin~~
above, & resting (sharply defined)
on yellow sand.

Oct. 1 - 1910

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Left Town City with Liddings
at 11 am. & drove to

Sand won in afternoon from
Mansonia.

Collected plants (see next page)

Found - 3 puff balls, 2 Agaves

My big Mansonia exposure
(buried here) is opposite Main
street N. of Herby Ave

Sand mound - Louisiana co 10/10

Aster sericeus

"

Lithospermum

Artemisia caudata

Andropogon scoparius

Bouteloua oligostachya

Helianthus occidentalis

Physalis

Cypripedium acaule

Fraxinus

Polygala verticillata

Polygonum tenue

Lespedeza capitata

Polygala sanguinea

Viola

Aster deltoideus

Oxalis

Artemisia ludoviciana

Ambrosia psilostachya

Sand-flat - Missouri co 10/10¹⁸³

Helianthus giganteus

Rudbeckia hirta

Aster multiflorus

Andropogon scoparius

Bouteloua oligostachya

Aster (T. multiflorus)

Helianthus annuus

Impatiens

Trifolium (Trifolium repens)

Lactuca

185

.75
 7.26 $\frac{1}{2}$
 1.50
 3.45
 3.87 $\frac{1}{2}$
 5.63
 4.64
 2.00
 2.20
 4.97
 1.56
 4.12
 4.85
 4.75
 1.75
 2.82
 2.00
 2.05
 1.25
 1.50
 4.25
 4.40
 2.69
 2.95
 2.50
 4.31
 4.56
 3.98
 2.70

Real (can)

189

Sep. 5 - Breakfast, dinner, 1.00
 Fair, rides & admission 44
 Supper, Oak City Rest 25
 RR. (to Oak City) 1.00
 Sep. 6 - Breakfast, dinner, 1.50
 Fare to Hudson 39
 Team 1.50
 (to Hudson) 25
 RR to Hudson 31
 Sep. 7 - Dinner at 2.50
 8 - RR to 2.26
 Lunch, dinner 20
 Team, (to Hudson) 1.60
 (to Hudson) 2.50
 9 - RR to 1.11
 (to Hudson) 2.20
 Finding team J. Tracy 25
 Team 2.50
 Supper & lodging, West Hotel 1.00
 10 - Breakfast 1.50
 RR to Sioux City .83
 Lunch, dinner, 2.25
 Carfare to & from M. River 1.00
 (to M. River) 1.00
 Supper, (to M. River) 1.30
 (to M. River) 1.00
 Sep. 11 - RR to Fargo, N.D., 1.15
 Breakfast, (to Fargo) 1.35
 RR to 1.15
 Dinner 75, supper 65 1.40
 Room - West Hotel 1.00
 Sep. 12 - RR to Hornick .51
 Breakfast, Commercial Hotel, Supper 70
 Mrs. A.E. Camp, Holly Springs, 50
 Livery - (to Hornick) 2.50
 (Arlington Hotel, Rodney, Rodney) 4355 50
 RR to Rodney, N.D. 24

Sep. 13 - (Breakfast - Arlington - Rodney)
 Dinner Central Hotel, Autha - \$3.50
 Horse feed - living horse " - 35
 Livery - Rodney - 2.50

(Hotel Arlington - Lodging
 Breakfast
 Supper } 1.50

RR. to Arion .79

RR. to Mo. Valley .72

Room, Miller Hotel #4356 .50

Sep. 14 - Room & Lodging 1.50

(Breakfast & dinner Miller Hotel - 1.00

RR. to Co. Bluffs - .43

Street car to So. Omaha & return .30

Lunch (supper) Boston Lunch room .25

Room - Brown Hotel 1.00

Sep. 15 - Street car to So. Omaha & return .30

Breakfast & lunch for field - Boston Lunch room .45

Supper - Boston Lunch room .25

RR. to Iowa City 5.24

Cab (return) " " .25



Side view.

Bottom view
 of container

Cross-section of Federal
 Alpha & Beta
 White Flamingo
 Valley Research

Independence - Oct. 1-1913
RR to Independence \$ 1.42
to Emporia 119
Kansan City
12 RR - 77

		Oct. 8. 1913	
212	T	Car. R. Co.	50
"	"	Independence	78
213	T	"	25
214	T	"	20

Rev. Jan Stefan Brz^l
St. Joseph's Hospital
Omaha, Neb.

K. A. Anderson
Box 156
Sioux City, Ia.

J. E. Carman
Bayard
Iowa

Paul J. Kruse
Inspector
Ind.

Bernhardt, in
Bernhardt, Langston
Horse Falls.

Albert Collins (father)
C. J. Collins (son)
Saw him - E. of
Sioux Falls



